S
333.705
E13m
1979

PLEASE RETURN

# HISTORICAL ENERGY STATISTICS

Vol. 3

STATE DOCUMENTS COLLECTION

OCT 12 1979

MONTANA STATE LIBRARY
930 E Lyndale Ave
Helena, Montana 59601

MONTANA DEPARTMENT OF NATURAL RESOURCES & CONSERVATION
ENERGY DIVISION
MAY 1979
DNRC

Montana State Library
3 0864 1004 5465 4

# HISTORICAL ENERGY STATISTICS

Vol. 3

Prepared by
Rick Itami

May 1979

Department of Natural Resources and Conservation
Ted J. Doney, Director

Energy Division
Bob Anderson, Administrator

32 S. Ewing
Helena, Montana 59601
(406) 449-3940

# CONTENTS

Acknowledgements ..... iv

Introduction ..... v

Abbreviations ..... vi

Definitions ..... vii

1. Energy Production and Consumption ..... 1

2. Electricity ..... 9

3. Coal ..... 23

4. Natural Gas ..... 35

5. Crude Petroleum and Petroleum Products ..... 47

6. Uranium ..... 65

Appendix ..... 69

# ACKNOWLEDGEMENTS

The author wishes to acknowledge the contribution of Bill Christiansen, who directed the preparation of the first volume of *Montana Historical Energy Statistics* in 1976. From 1973 through 1976, as Lieutenant Governor, Bill was in charge of energy policy for the state. He has headed the Montana Energy Advisory Council and the Montana Energy Office, and is regarded by many as Montana's leading expert on energy.

The author would like to acknowledge the work of Terry Wheeling, who prepared the first edition of *Montana Historical Energy Statistics* in 1976.

Also acknowledged are the following DNRC personnel: Peggy Todd and Dave Lambert, editing; Patti McCarthy, typesetting; Gary Wolf, layout and design; Don Howard, art work; Peggy Todd, cover design; and Emelia Satre, Kay Satre, and Joyce Keltz, typing.

# INTRODUCTION

*Montana Historical Energy Statistics* is a compilation of energy consumption and production data gathered from state, federal, and private sources. In some instances, two data sources may show different figures for basically the same data item. Such discrepancies are the result of differences in data collection methods and reporting procedures between the two sources.

This document was formerly prepared by the Montana Energy Office under the Office of the Lieutenant Governor. On July 1, 1978, the Montana Energy Office became part of the Energy Division of the Department of Natural Resources and Conservation.

Some of the sources cited with tables consist of only the name of an office, bureau, or company with no reference to a particular publication. In such cases, the information was requested by telephone. The agency responding to the request retrieved the data via computer terminals from automated data base files. The information was then relayed by telephone to the Energy Division.

General Note:

For all tables, individual items may not add to totals because of independent rounding.

# ABBREVIATIONS

| | |
|---|---|
| AGA | American Gas Association |
| BR | United States Bureau of Reclamation |
| Btu | British thermal units |
| CE | United States Army Corps of Engineers |
| FIP | United States Department of Interior, Flathead Irrigation Project |
| kWh | kilowatt hours |
| LPG | liquid petroleum gas |
| MCF | thousand cubic feet |
| MDU | Montana-Dakota Utilities |
| MEC | Montana Energy Council |
| MLP | Montana Light and Power |
| MMCF | million cubic feet |
| MPC | Montana Power Company |
| NA | not available |
| NGL | natural gas liquids |
| p | preliminary data |
| PPL | Pacific Power and Light |
| PSP&L | Puget Sound Power and Light |
| SIC | Standard Industrial Classification (Code) |
| WWP | Washington Water Power |

# DEFINITIONS

**Associated Natural Gas**
Natural gas which occurs in crude oil reservoirs as free gas.

**Non-associated Natural Gas**
Free natural gas not in contact with crude oil in the reservoir.

**Crude Oil**
Raw, unrefined oil as it appears at the time of extraction from its natural reservoir.

**Distillate Fuel Oils**
Products of refinery distillation sometimes referred to as middle distillates, i.e., kerosine, diesel fuel, home heating oil.

**Firm**
Natural gas deliveries which will not be interrupted even during times of shortages.

**Interruptible**
Natural gas deliveries that may be interrupted during times of shortages.

**Mine-mouth Price**
The price of coal at the point of extraction before taxes, processing costs and transportation costs are added.

**Condensate**
Liquid hydrocarbons produced with natural gas which are separated from the gas by cooling and various other means.

**Raw NGL Mix**
A mixed hydrocarbon stream containing, in whole or part, mixtures of ethane, butane (isobutane and normal butane), propane or natural gasoline.

**Residuals**
Oils that are "leftovers" in various refining processes; heavy black oils used in ships' boilers and in heating plants.

1

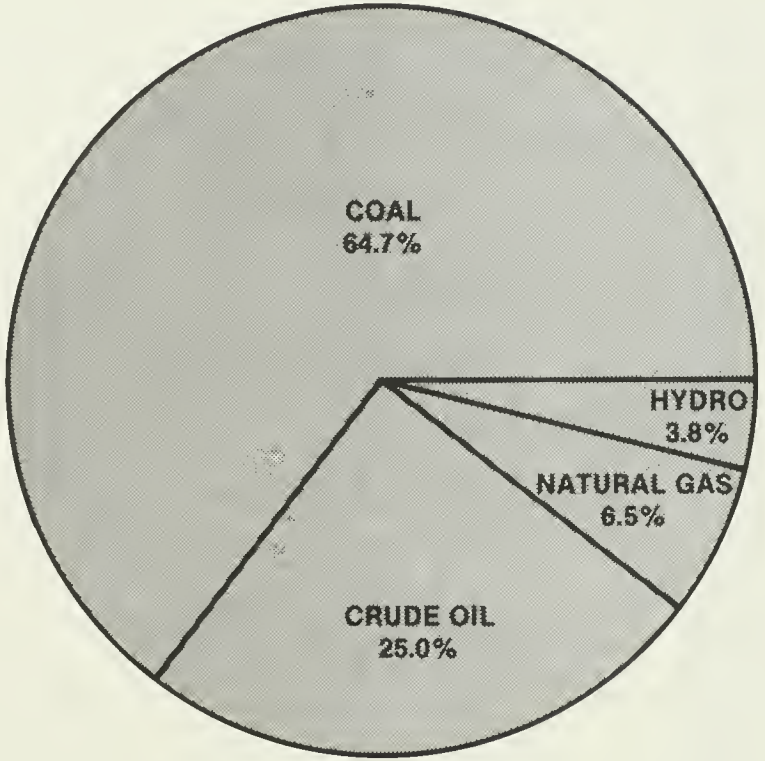
# ENERGY PRODUCTION AND CONSUMPTION

## HIGHLIGHTS

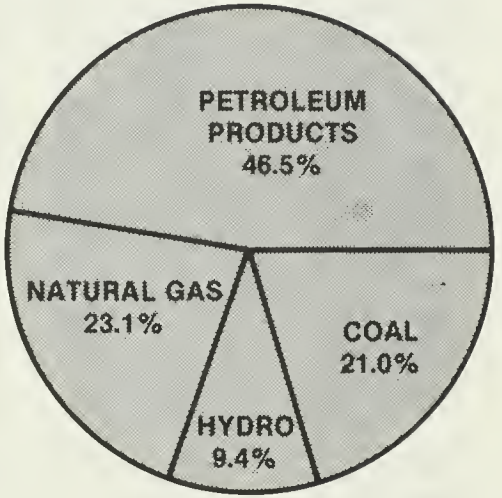
- Total production of energy in Montana amounted to 733 trillion British Thermal Units (Btu's) in 1977, up 1 percent from the revised 1976 figure of 729 trillion Btu's.
- Of the energy produced in Montana during 1977, coal accounted for 64.7 percent, crude oil 25.0 percent, natural gas 6.5 percent, and hydroelectric generation 3.8 percent.
- The amount of energy consumed in Montana was 284 trillion Btu's in 1977, an increase of 2 percent from the previous year.
- Consumption of petroleum products accounted for 46.5 percent of Montana's energy consumption in 1977, natural gas 23.1 percent, coal 21.0 percent, and hydroelectric power 9.4 percent.
- The residential/commercial sector consumed 24.6 percent of the energy in 1977, the transportation sector consumed 30.5 percent, and the industrial and other sectors consumed 44.9 percent.

## FIGURES


| Figure | | Page |
|---|---|---|
| 1.1 | Production and Consumption of Energy in Montana in 1977 | 2 |
| 1.2 | Production and Consumption of Energy in Montana, 1960-77 | 3 |
| 1.3 | Consumption of Energy in Montana, by Sector, 1960-77 | 4 |
| 1.4 | Consumption of Energy in Montana, by Type of Fuel, 1960-77 | 5 |
| 1.5 | Production of Energy in Montana, by Type of Fuel, 1960-77 | 6 |
| 1.6 | Production, Consumption, Imports and Exports of Fossil Fuels in Montana in 1977 | 7 |




PRODUCTION
733 TBtu's




CONSUMPTION
284 TBtu's

FIGURE 1.1 PRODUCTION AND CONSUMPTION OF ENERGY IN MONTANA IN 1977

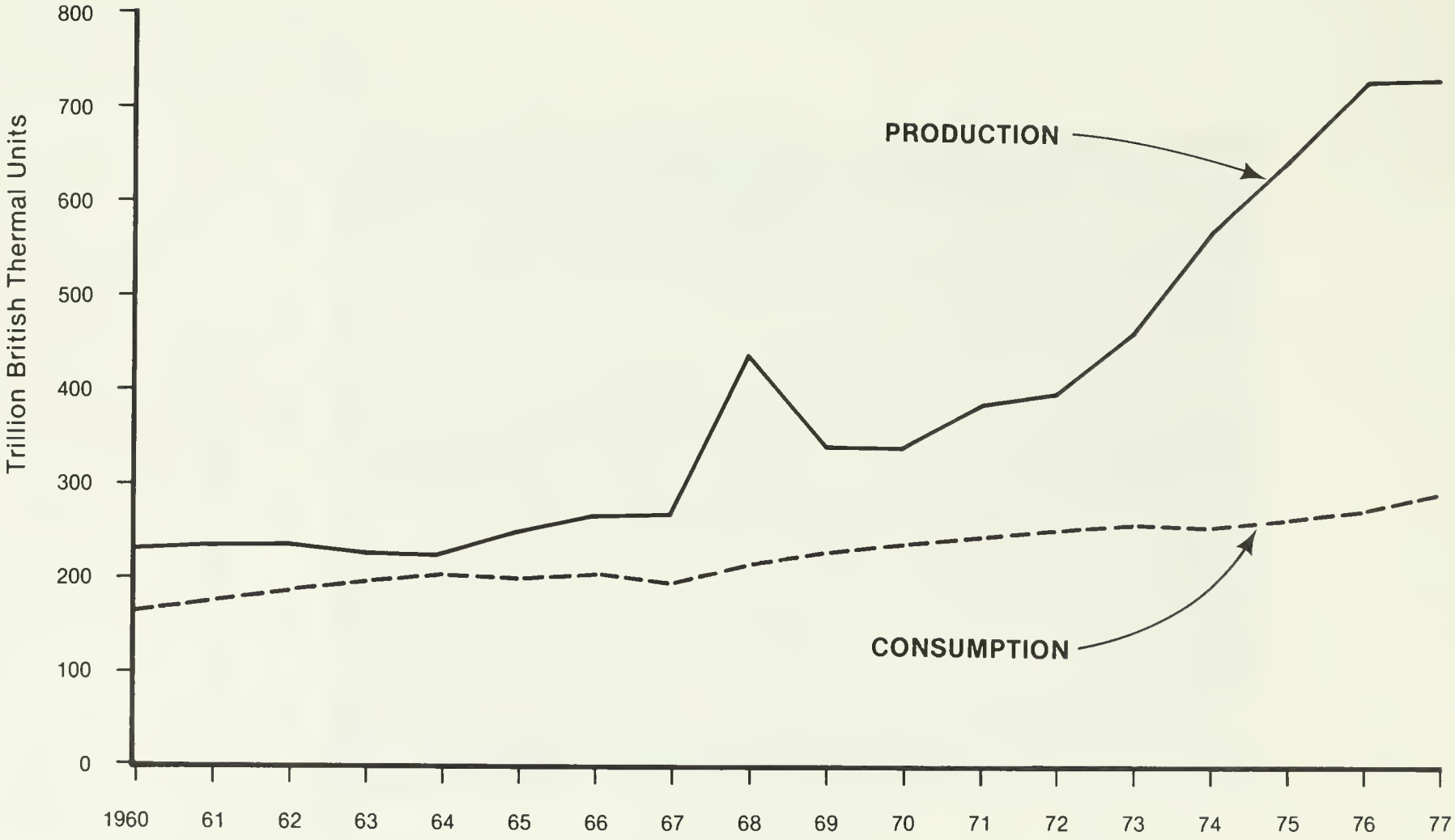



FIGURE 1.2 PRODUCTION AND CONSUMPTION OF ENERGY IN MONTANA, 1960-77

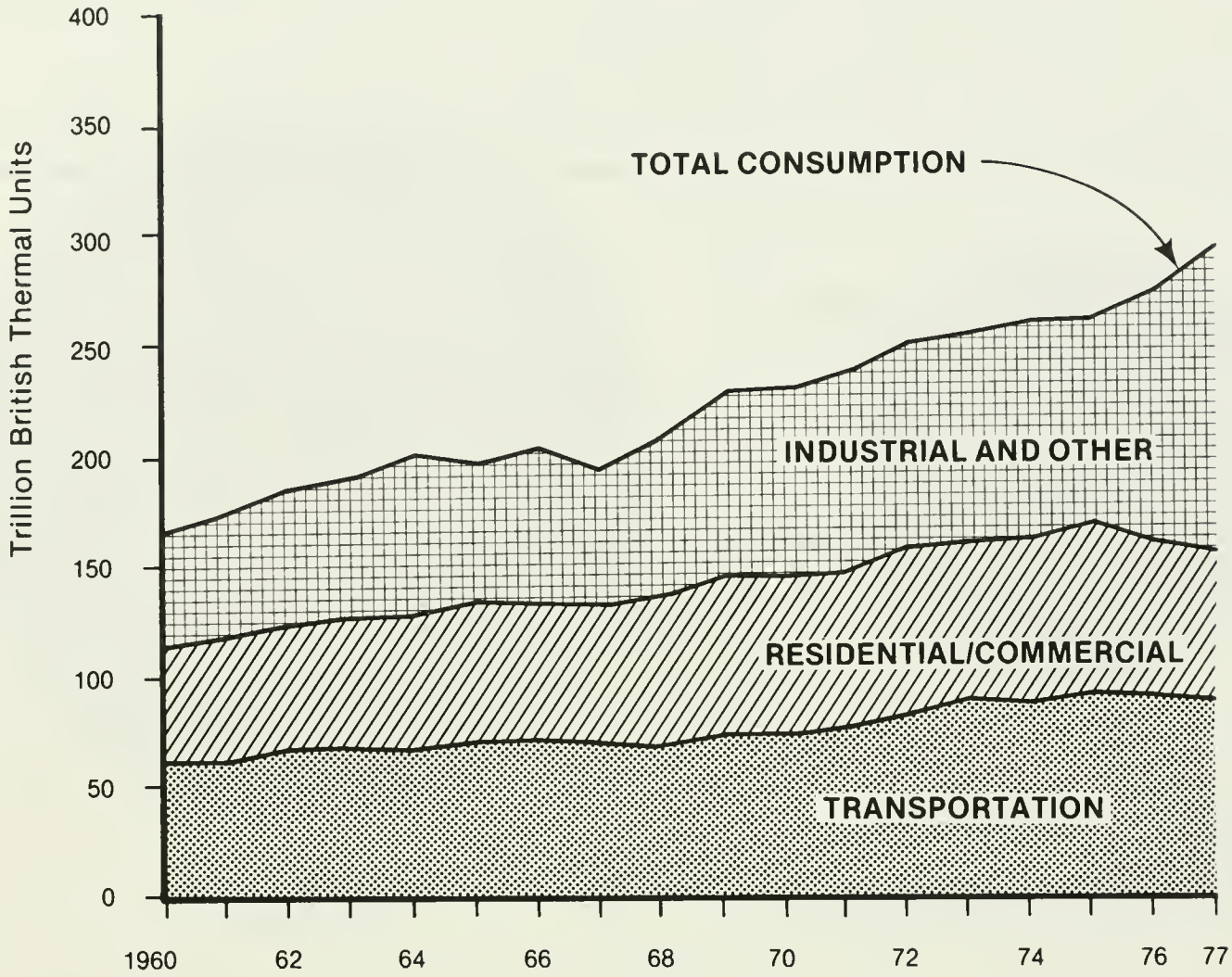



**FIGURE 1.3 CONSUMPTION OF ENERGY IN MONTANA, BY SECTOR, 1960-77**

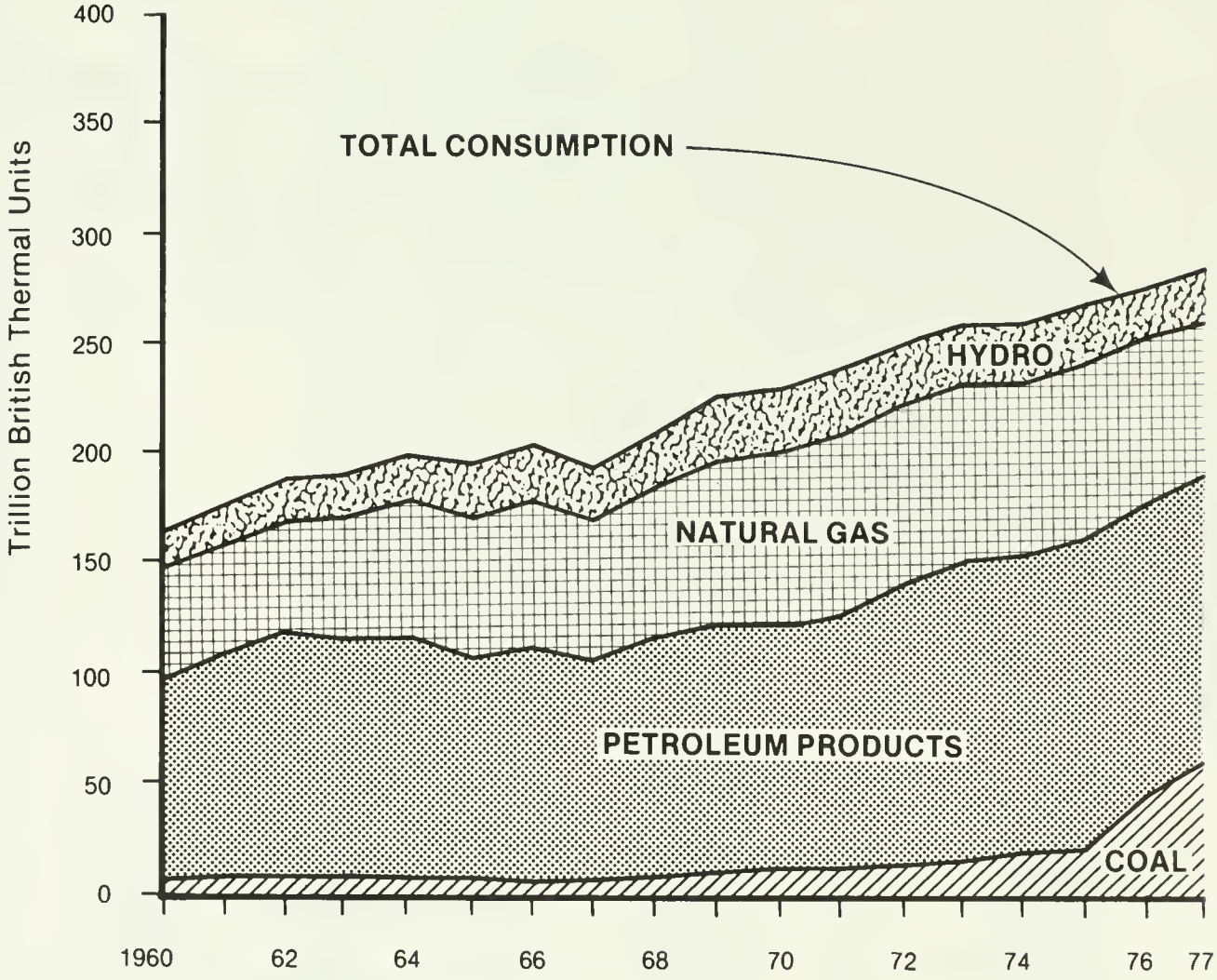



FIGURE 1.4 CONSUMPTION OF ENERGY IN MONTANA, BY TYPE OF FUEL, 1960-77

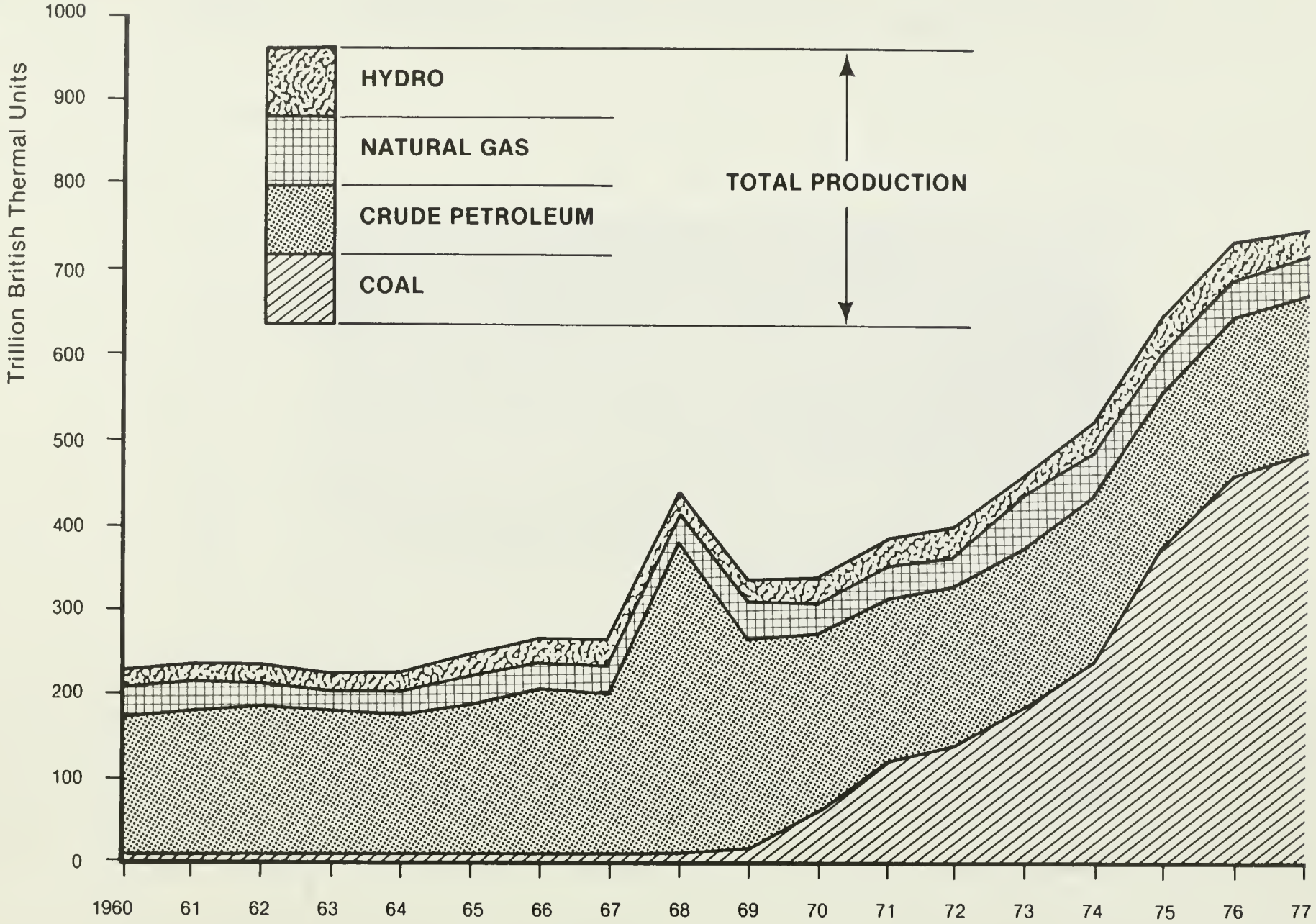



**FIGURE 1.5 PRODUCTION OF ENERGY IN MONTANA, BY TYPE OF FUEL, 1960-77**

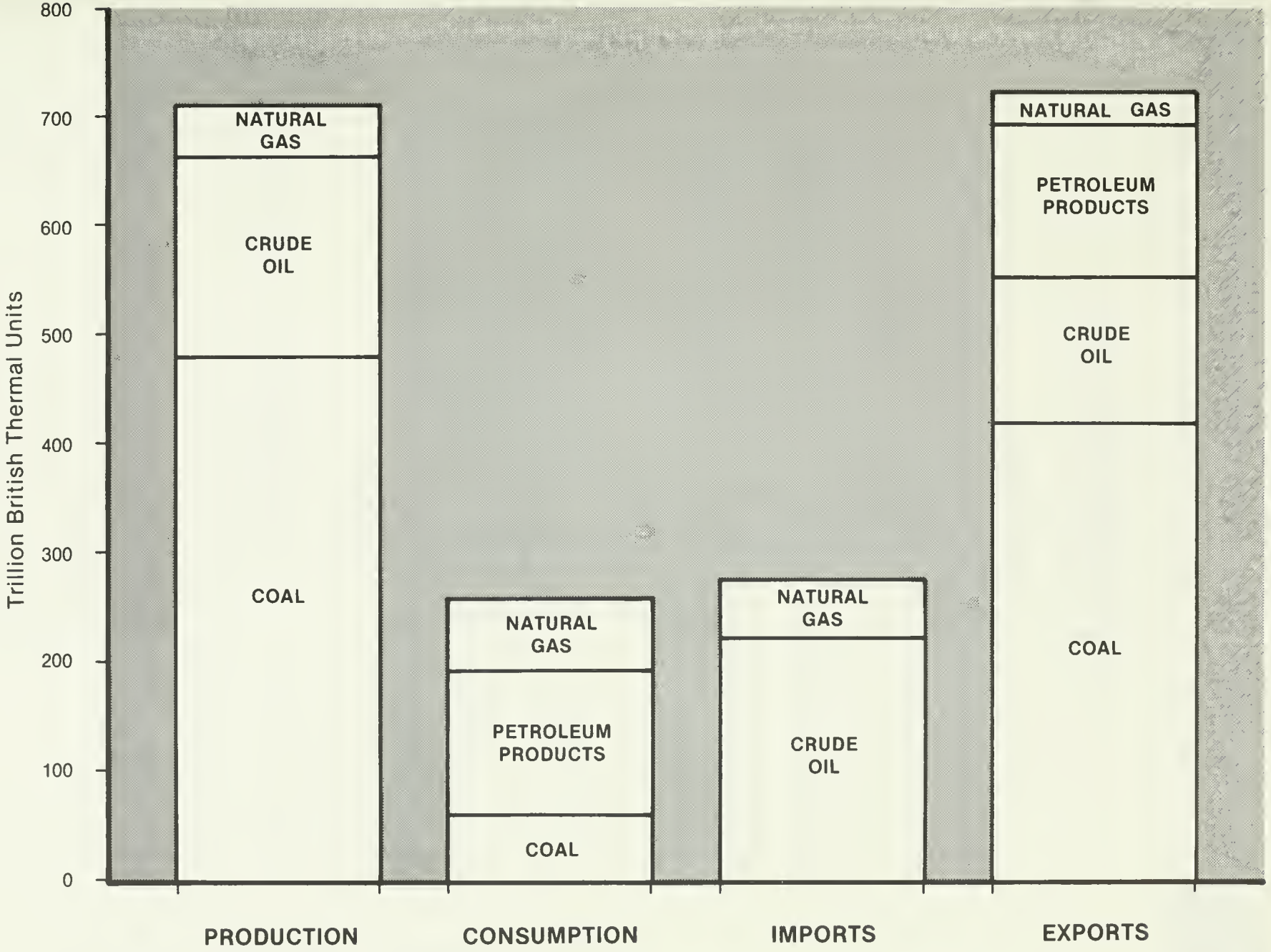



FIGURE 1.6 PRODUCTION, CONSUMPTION, IMPORTS AND EXPORTS OF FOSSIL FUELS IN MONTANA IN 1977

# 2

# ELECTRICITY

## HIGHLIGHTS

- Hydroelectric and fossil fuel plants in Montana generated 13.5 billion kilowatt-hours (kWh) of electricity in 1977, down 16 percent from the previous year.
- Hydroelectric generation in 1977, at 8.5 billion kWh, was down 32 percent from 1976, primarily because of 1977's drought.
- Montana's coal-fired plants produced 4.8 billion kWh of electricity in 1977, an increase of 35 percent from the previous year.
- Electric utilities sold 10.0 billion kWh in Montana during 1977, an increase of 4 percent from 1976.
- Residential customers paid an average of 2.38 cents per kWh in 1977, commercial customers paid an average of 1.90 cents per kWh, and industrial customers paid an average of .67 cents per kWh.

## TABLES


| Table | | Page |
|---|---|---|
| 2.1 | Electric Generating Capacity in Montana | 10 |
| 2.2 | Annual Generation of Electricity in Montana, 1950-77 | 12 |
| 2.3 | Monthly Sales of Electricity in Montana by Electric Utilities | 14 |
| 2.4 | Annual Sales of Electricity by the Electric Utility Industry in Montana | 16 |
| 2.5 | Average Annual Prices for Electricity Sold in Montana | 18 |
| 2.6 | Industrial Consumption of Electricity in Montana by SIC Code, 1976 and 1977 | 19 |
| 2.7 | Consumption of Fuels by Electric Utilities in Montana | 20 |


## FIGURES


| Figure | | Page |
|---|---|---|
| 2.1 | Annual Generation of Electricity in Montana, 1950-77 | 11 |
| 2.2 | Annual Sales of Electricity in Montana, 1950-77 | 13 |
| 2.3 | Annual Generation and Sales of Electricity in Montana , 1950-77 | 17 |

## TABLE 2.1
## ELECTRIC GENERATING CAPACITY IN MONTANA

| | Owner | Year of Completion | Nameplate Capacity (MW) | Location |
|---|---|---|---|---|
| **EXISTING HYDRO PLANTS** | | | | |
| 1. Madison | MPC | 1912 | 9.0 | Madison River |
| 2. Hauser | MPC | 1912 | 17.0 | Missouri River |
| 3. Holter | MPC | 1918 | 38.4 | Missouri River |
| 4. Black Eagle | MPC | 1929 | 16.8 | Missouri River |
| 5. Rainbow | MPC | 1929 | 35.6 | Missouri River |
| 6. Ryan | MPC | 1929 | 48.0 | Missouri River |
| 7. Morony | MPC | 1930 | 45.0 | Missouri River |
| 8. Cochrane | MPC | 1957 | 48.0 | Missouri River |
| 9. Mystic Lake | MPC | 1927 | 10.0 | West Rosebud Cr. |
| 10. Flint Creek | MPC | 1935 | 1.0 | Flint Creek |
| 11. Milltown | MPC | 1929 | 3.0 | Clark Fork River |
| 12. Thompson Falls | MPC | 1929 | 30.0 | Clark Fork River |
| 13. Kerr | MPC | 1938 | 168.0 | Flathead River |
| 14. Noxon | WWP | 1960 | 397.0 | Clark Fork River |
| 15. Big Fork | PPL | 1930 | 4.26 | Swan Lake |
| 16. Fort Peck | CE | 1940 | 165.0 | Missouri River |
| 17. Canyon Ferry | BR | 1954 | 50.0 | Missouri River |
| 18. Hungry Horse | BR | 1953 | 285.0 | S. Fork Flathead River |
| 19. Yellowtail | BR | 1966 | 250.0 | Bighorn River |
| 20. Big Creek | FIP | 1916 | .36 | Big Creek |
| 21. Troy | MLP | 1916 | 4.5 | Lake Creek |
| 22. Libby 1-4 | CE | 1976 | 420.0 | Kootenai River |
| **Total Hydropower** | | | **2,045.92** | |
| **EXISTING FOSSIL PLANTS[1]** | | | | |
| 1. Frank Bird | MPC | 1951 | 69.0 | Billings, Montana |
| 2. J. E. Corrette | MPC | 1968 | 173.0 | Billings, Montana |
| 3. Lewis and Clark | MDU | 1955 | 50.0 | Sidney, Montana |
| 4. Libby (standby) | CE | 1972 | 25.0 | Libby, Montana |
| 5. Miles City | MDU | 1972 | 23.26 | Miles City, Montana |
| 6. Glendive | MDU | 1927 | 7.0 | Glendive, Montana |
| 7. Colstrip I | [2] | 1975 | 358.0 | Colstrip, Montana |
| 8. Colstrip II | [2] | 1976 | 358.0 | Colstrip, Montana |
| **Total Fuels** | | | **1,063.26** | |
| **TOTAL GENERATION** | | | **3,109.18** | |

Source: U. S. Department of Energy, Energy Information Administration, *Plant and Ownership List* (Supplementary to the maps entitled Principle Electric Facilities, 1978), June 1978.

[1]Of the fossil plants generating steam, J. E. Corrette, Lewis and Clark, and Colstrip I and II use coal; Frank Bird uses oil and gas; Libby uses diesel; and Miles City and Glendive use gas.

[2]MPC and PSP&L

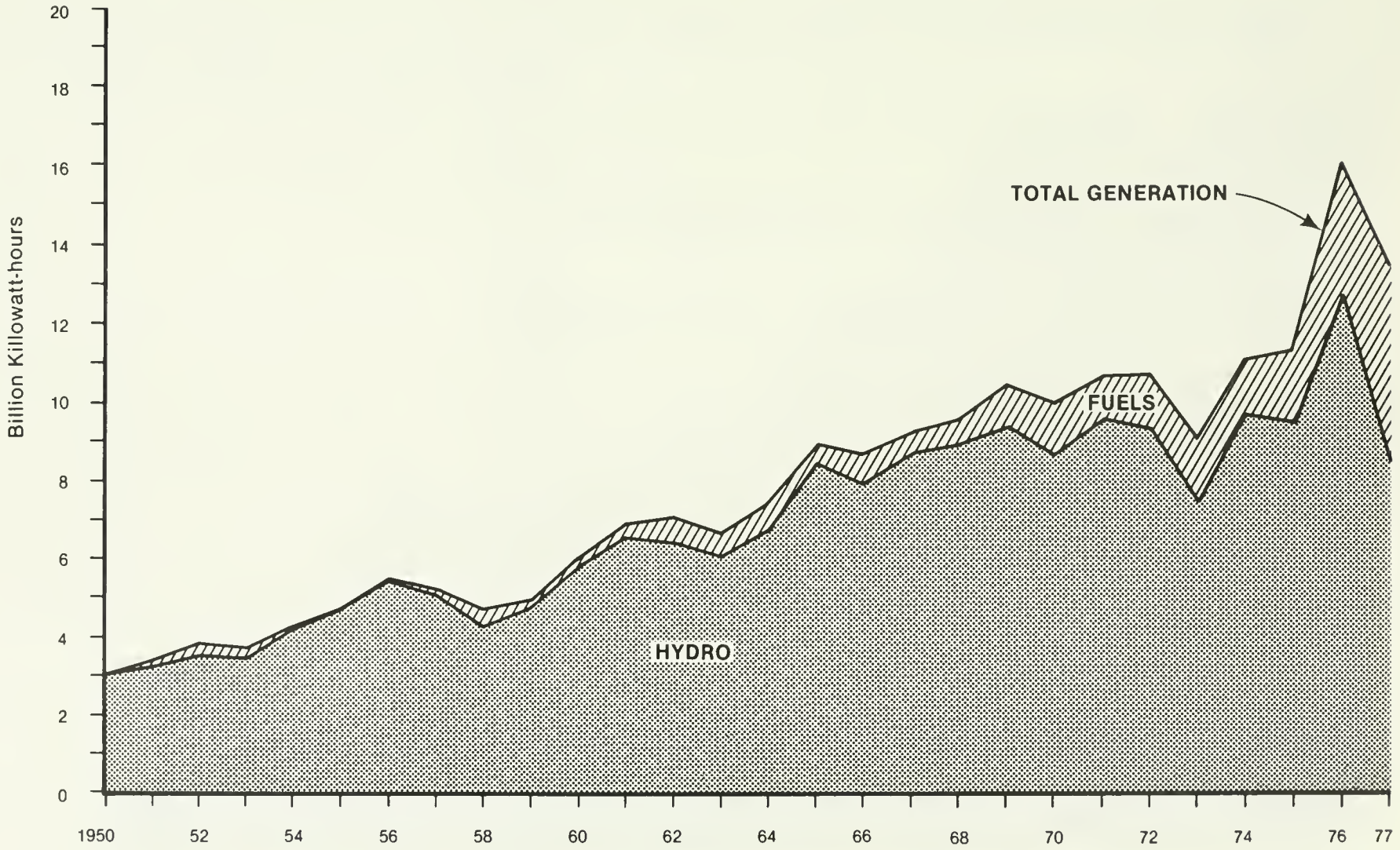



FIGURE 2.1 ANNUAL GENERATION OF ELECTRICITY IN MONTANA, 1950-77

# TABLE 2.2
# ANNUAL GENERATION OF ELECTRICITY IN MONTANA, 1950-77[1]

| Year | Total | HYDRO | | COAL | | OIL | | GAS | | WOOD & WASTE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Million kWh Generated | % of State Total | Million kWh Generated | % of State Total | Million kWh Generated | % of State Total | Million kWh Generated | % of State Total | Million kWh Generated | % of State Total |
| 1950 | 3,136 | 3,107 | 99 | NA | | NA | | NA | | NA | |
| 1951 | 3,304 | 3,259 | 99 | NA | | NA | | NA | | NA | |
| 1952 | 3,778 | 3,464 | 92 | NA | | NA | | NA | | NA | |
| 1953 | 3,719 | 3,424 | 92 | NA | | NA | | NA | | NA | |
| 1954 | 4,274 | 4,246 | 99 | NA | | NA | | NA | | NA | |
| 1955 | 4,696 | 4,679 | 99 | NA | | NA | | NA | | NA | |
| 1956 | 5,495 | 5,459 | 99 | NA | | NA | | NA | | NA | |
| 1957 | 5,215 | 4,969 | 95 | NA | | NA | | NA | | NA | |
| 1958 | 4,551 | 4,224 | 93 | NA | | NA | | NA | | NA | |
| 1959 | 4,934 | 4,720 | 96 | NA | | NA | | NA | | NA | |
| 1960 | 5,992 | 5,801 | 97 | NA | | NA | | NA | | NA | |
| 1961 | 6,780 | 6,499 | 96 | 263 | 4 | 0 | 0 | 19 | [2] | 0 | 0 |
| 1962 | 7,051 | 6,410 | 91 | 291 | 4 | 1 | [2] | 349 | 5 | 0 | 0 |
| 1963 | 6,594 | 6,011 | 91 | 284 | 4 | 0 | 0 | 299 | 5 | 0 | 0 |
| 1964 | 7,360 | 6,821 | 93 | 286 | 4 | 2 | [2] | 220 | 3 | 31 | [2] |
| 1965 | 8,882 | 8,389 | 94 | 285 | 3 | 0 | 0 | 171 | 2 | 37 | [2] |
| 1966 | 8,611 | 7,940 | 92 | 317 | 4 | 43 | [2] | 273 | 3 | 38 | [2] |
| 1967 | 9,117 | 8,703 | 95 | 314 | 3 | 3 | [2] | 41 | [2] | 56 | 1 |
| 1968 | 9,495 | 8,925 | 94 | 434 | 5 | 10 | [2] | 52 | [2] | 74 | 1 |
| 1969 | 10,442 | 9,447 | 90 | 735 | 7 | 52 | [2] | 147 | 1 | 61 | 1 |
| 1970 | 10,026 | 8,745 | 87 | 966 | 10 | 14 | [2] | 228 | 2 | 73 | 1 |
| 1971 | 10,653 | 9,595 | 90 | 901 | 8 | 1 | [2] | 96 | 1 | 60 | 1 |
| 1972 | 10,689 | 9,444 | 88 | 1,079 | 10 | 7 | [2] | 108 | 1 | 50 | [2] |
| 1973 | 9,132 | 7,517 | 82 | 1,303 | 14 | 69 | [2] | 195 | 2 | 48 | 1 |
| 1974 | 11,056 | 9,726 | 88 | 1,210 | 11 | 6 | [2] | 98 | 1 | 16 | [2] |
| 1975 | 11,231 | 9,560 | 85 | 1,544 | 14 | 17 | [2] | 96 | 1 | 14 | [2] |
| 1976 | 16,090 | 12,406 | 77 | 3,556 | 22 | 32 | [2] | 64 | [2] | 32 | [2] |
| 1977 | 13,484 | 8,460 | 63 | 4,788 | 36 | 92 | 1 | 87 | 1 | 46 | [2] |

Source: U. S. Department of Energy, Energy Information Administration Energy Data Reports, *Energy Power Statistics*, monthly.

[1]Electrical generation data represent only that power generated by public utilities and does not include self-generated industrial electrical power.

[2]less than 0.5

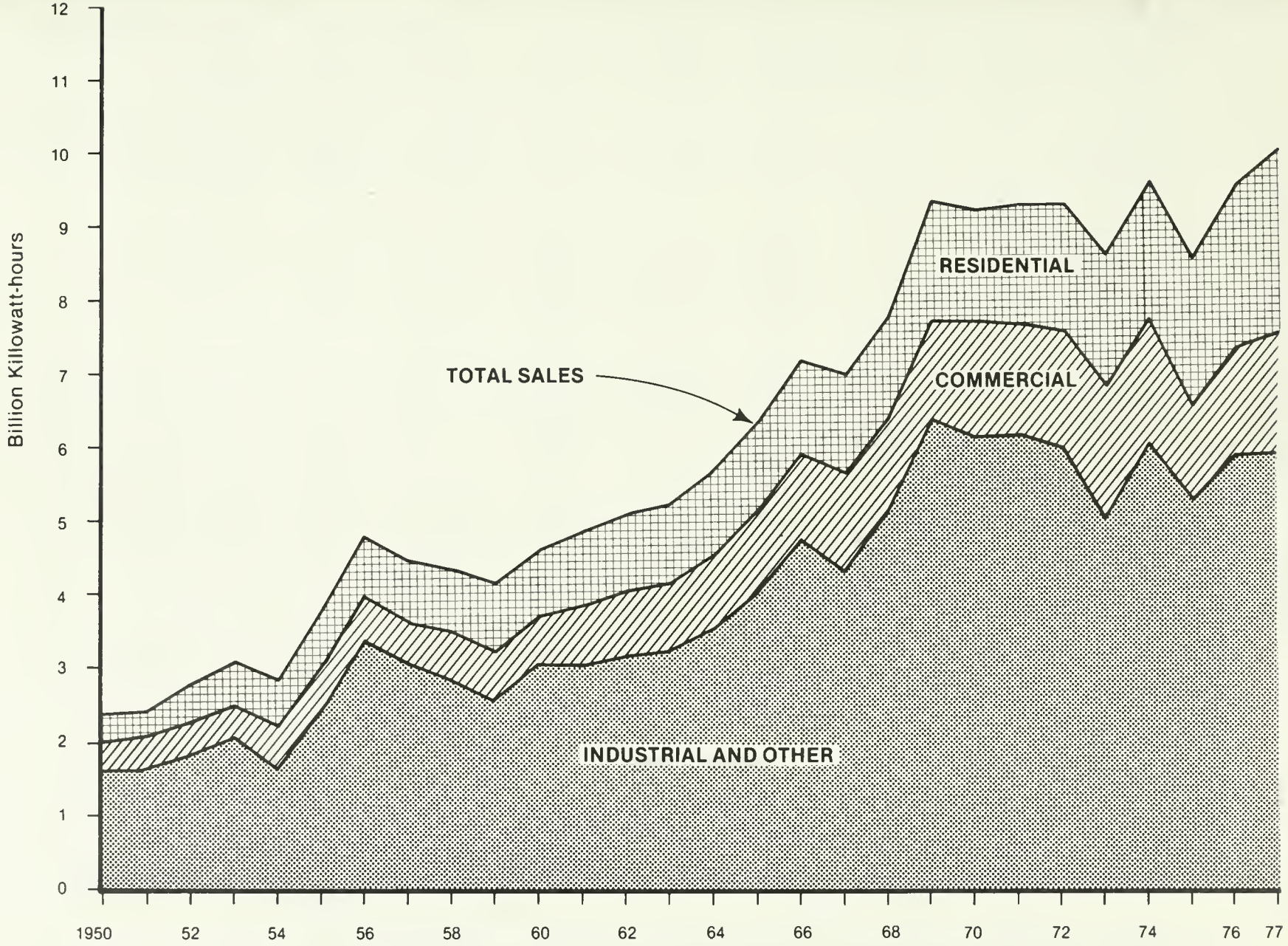



FIGURE 2.2 ANNUAL SALES OF ELECTRICITY IN MONTANA, 1950-77

# TABLE 2.3
## MONTHLY SALES OF ELECTRICITY IN MONTANA BY ELECTRIC UTILITIES
## (thousand kWh)

| Year | Sector | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | Residential | 87,817 | 86,156 | 86,172 | 78,700 | 74,016 | 71,708 | 69,122 | 70,021 | 72,281 | 72,788 | 78,160 | 88,423 | 935,364 |
| | Commercial | 40,851 | 40,920 | 40,693 | 37,987 | 38,233 | 37,677 | 37,542 | 39,941 | 40,747 | 39,473 | 40,556 | 44,419 | 479,039 |
| | Industrial | 192,702 | 206,245 | 262,319 | 263,102 | 267,841 | 261,080 | 249,175 | 250,586 | 249,098 | 255,737 | 243,306 | 250,196 | 2,951,387 |
| | Other | 15,930 | 16,460 | 17,522 | 17,095 | 16,958 | 16,398 | 16,005 | 19,356 | 18,150 | 18,847 | 17,586 | 18,413 | 208,720 |
| | **TOTAL** | **337,300** | **349,781** | **406,706** | **396,884** | **397,048** | **386,863** | **371,844** | **379,904** | **380,276** | **386,845** | **379,608** | **401,451** | **4,574,510** |
| 1961 | Residential | 94,714 | 89,265 | 82,793 | 79,128 | 78,238 | 75,587 | 72,428 | 72,221 | 77,654 | 79,289 | 83,809 | 96,727 | 981,853 |
| | Commercial | 43,745 | 44,111 | 40,965 | 40,209 | 40,766 | 43,527 | 42,932 | 42,376 | 45,316 | 41,664 | 44,097 | 48,062 | 517,770 |
| | Industrial | 245,523 | 222,879 | 241,307 | 239,366 | 255,179 | 250,378 | 254,137 | 249,779 | 237,969 | 252,472 | 254,771 | 271,577 | 2,975,337 |
| | Other | 17,447 | 17,069 | 18,282 | 16,729 | 17,031 | 17,904 | 18,566 | 21,490 | 20,826 | 18,835 | 18,577 | 19,636 | 222,392 |
| | **TOTAL** | **401,429** | **373,324** | **383,347** | **375,432** | **391,214** | **387,396** | **388,063** | **385,866** | **381,765** | **392,260** | **401,254** | **436,002** | **4,697,352** |
| 1962 | Residential | 103,908 | 101,586 | 94,433 | 87,906 | 78,729 | 80,367 | 75,441 | 75,490 | 79,620 | 80,599 | 86,901 | 96,516 | 1,041,496 |
| | Commercial | 48,422 | 48,102 | 45,271 | 44,031 | 43,209 | 43,721 | 44,099 | 45,949 | 45,939 | 44,353 | 47,717 | 49,951 | 550,764 |
| | Industrial | 270,801 | 243,237 | 277,876 | 277,380 | 283,922 | 271,608 | 244,388 | 238,120 | 228,811 | 252,574 | 249,926 | 260,819 | 3,099,462 |
| | Other | 19,118 | 18,525 | 21,089 | 21,697 | 19,619 | 19,238 | 20,484 | 23,301 | 22,951 | 23,013 | 21,460 | 23,893 | 254,388 |
| | **TOTAL** | **442,249** | **411,450** | **438,669** | **431,014** | **425,479** | **414,934** | **384,412** | **382,860** | **377,321** | **400,539** | **406,004** | **431,179** | **4,946,110** |
| 1963 | Residential | 103,835 | 110,481 | 94,644 | 86,648 | 85,447 | 81,989 | 79,996 | 80,482 | 82,349 | 82,375 | 87,151 | 102,086 | 1,077,483 |
| | Commercial | 49,276 | 50,336 | 46,788 | 46,194 | 45,541 | 46,639 | 47,013 | 48,163 | 48,917 | 46,782 | 47,620 | 50,646 | 573,915 |
| | Industrial | 263,088 | 244,329 | 269,286 | 260,528 | 257,708 | 252,494 | 254,657 | 265,693 | 263,189 | 279,350 | 279,286 | 301,282 | 3,190,890 |
| | Other | 22,146 | 22,082 | 22,755 | 21,353 | 21,007 | 20,379 | 19,564 | 24,581 | 22,728 | 21,934 | 19,814 | 20,273 | 258,616 |
| | **TOTAL** | **438,345** | **427,228** | **433,473** | **414,723** | **409,703** | **401,501** | **401,230** | **418,919** | **417,183** | **430,441** | **433,871** | **474,287** | **5,100,904** |
| 1964 | Residential | 113,972 | 104,130 | 99,613 | 98,215 | 90,238 | 83,836 | 83,917 | 85,367 | 86,431 | 89,147 | 93,850 | 109,881 | 1,138,597 |
| | Commercial | 53,376 | 52,679 | 50,467 | 49,839 | 48,678 | 47,549 | 48,107 | 52,939 | 50,029 | 49,286 | 52,242 | 54,615 | 609,806 |
| | Industrial | 269,594 | 278,635 | 307,385 | 287,199 | 310,487 | 305,908 | 295,793 | 296,836 | 299,569 | 307,596 | 299,974 | 284,944 | 3,543,920 |
| | Other | 21,883 | 22,113 | 21,961 | 20,066 | 20,042 | 19,200 | 19,516 | 22,078 | 17,852 | 21,559 | 20,456 | 21,846 | 248,572 |
| | **TOTAL** | **458,825** | **457,557** | **479,426** | **455,319** | **469,445** | **456,493** | **447,333** | **457,220** | **453,881** | **467,588** | **466,522** | **471,286** | **5,540,895** |
| 1965 | Residential | 129,757 | 113,046 | 107,890 | 106,939 | 94,738 | 90,005 | 87,104 | 89,052 | 92,750 | 97,290 | 96,245 | 111,332 | 1,216,148 |
| | Commercial | 58,183 | 55,780 | 53,569 | 54,060 | 53,351 | 50,867 | 51,996 | 56,258 | 54,504 | 54,215 | 54,487 | 57,001 | 654,271 |
| | Industrial | 295,828 | 283,795 | 302,647 | 308,369 | 315,466 | 328,079 | 292,282 | 310,484 | 365,742 | 379,338 | 377,321 | 380,099 | 3,939,450 |
| | Other | 23,186 | 23,626 | 23,660 | 22,740 | 22,635 | 20,825 | 21,123 | 23,415 | 20,177 | 22,706 | 22,808 | 23,594 | 270,495 |
| | **TOTAL** | **506,954** | **476,247** | **487,766** | **492,108** | **486,190** | **489,776** | **452,505** | **479,209** | **533,173** | **553,549** | **550,861** | **572,026** | **6,080,364** |
| 1966 | Residential | 121,350 | 124,626 | 113,653 | 103,495 | 99,313 | 93,596 | 91,931 | 93,336 | 96,337 | 96,360 | 105,035 | 122,301 | 1,261,333 |
| | Commercial | 58,913 | 60,674 | 57,259 | 55,579 | 55,861 | 55,136 | 57,741 | 59,368 | 59,127 | 58,393 | 59,464 | 60,268 | 697,783 |
| | Industrial | 387,237 | 351,127 | 381,773 | 375,749 | 384,072 | 376,720 | 381,588 | 391,139 | 394,768 | 398,414 | 405,337 | 429,369 | 4,657,293 |
| | Other | 24,598 | 25,287 | 26,810 | 24,087 | 23,293 | 21,871 | 22,643 | 24,784 | 21,636 | 24,241 | 22,453 | 24,169 | 285,872 |
| | **TOTAL** | **592,098** | **561,714** | **579,495** | **558,910** | **562,539** | **547,323** | **553,903** | **568,627** | **571,868** | **577,408** | **592,289** | **636,107** | **6,902,281** |
| 1967 | Residential | 126,433 | 118,444 | 114,427 | 111,864 | 102,479 | 98,793 | 96,131 | 93,841 | 99,771 | 97,523 | 107,138 | 123,724 | 1,290,568 |
| | Commercial | 63,164 | 62,283 | 60,029 | 59,857 | 58,476 | 58,722 | 59,151 | 62,878 | 65,324 | 69,143 | 62,491 | 64,956 | 746,474 |
| | Industrial | 399,328 | 371,653 | 396,090 | 389,956 | 414,910 | 409,363 | 349,729 | 306,514 | 311,801 | 313,395 | 304,872 | 314,563 | 4,282,174 |
| | Other | 24,113 | 25,248 | 26,258 | 25,110 | 23,481 | 23,089 | 23,918 | 25,814 | 22,892 | 24,081 | 24,225 | 24,479 | 292,978 |
| | **TOTAL** | **613,038** | **577,628** | **596,804** | **586,787** | **599,346** | **589,967** | **528,929** | **489,047** | **499,788** | **504,142** | **498,726** | **527,992** | **6,612,194** |
| 1968 | Residential | 143,663 | 132,768 | 121,232 | 108,338 | 106,581 | 104,089 | 100,963 | 103,557 | 102,645 | 105,823 | 114,265 | 129,362 | 1,373,286 |
| | Commercial | 71,463 | 67,767 | 65,410 | 61,562 | 63,963 | 65,534 | 62,364 | 67,865 | 66,533 | 72,710 | 68,798 | 71,000 | 804,969 |
| | Industrial | 349,224 | 301,692 | 313,222 | 359,362 | 415,545 | 412,147 | 410,516 | 463,261 | 453,171 | 470,785 | 514,629 | 518,356 | 4,981,910 |
| | Other | 26,187 | 27,093 | 27,845 | 22,534 | 21,925 | 21,883 | 20,467 | 23,614 | 19,135 | 21,451 | 20,882 | 19,966 | 272,982 |
| | **TOTAL** | **590,537** | **529,320** | **527,709** | **551,796** | **608,014** | **603,653** | **594,310** | **658,297** | **641,484** | **670,769** | **718,574** | **738,684** | **7,433,147** |
| 1969 | Residential | 152,981 | 157,716 | 137,080 | 120,995 | 107,597 | 107,005 | 106,310 | 107,962 | 110,372 | 109,020 | 123,285 | 121,922 | 1,462,245 |
| | Commercial | 73,626 | 79,263 | 69,229 | 68,222 | 67,227 | 67,699 | 67,513 | 72,415 | 73,330 | 78,114 | 71,722 | 75,036 | 863,396 |
| | Industrial | 523,416 | 499,814 | 517,631 | 515,532 | 524,633 | 515,044 | 509,530 | 520,316 | 490,956 | 517,126 | 543,581 | 530,666 | 6,208,245 |
| | Other | 20,957 | 23,362 | 24,550 | 21,783 | 21,110 | 20,894 | 17,922 | 19,890 | 18,498 | 19,675 | 19,626 | 18,842 | 247,109 |
| | **TOTAL** | **770,980** | **760,155** | **748,490** | **726,532** | **720,567** | **710,642** | **701,275** | **720,583** | **693,156** | **723,935** | **758,214** | **746,466** | **8,780,995** |

## TABLE 2.3 (continued)
## MONTHLY SALES OF ELECTRICITY IN MONTANA BY ELECTRIC UTILITIES
## (thousand kWh)

| Year | Sector | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1970 | Residential | 152,800 | 147,131 | 130,734 | 126,382 | 120,747 | 111,014 | 111,686 | 117,988 | 117,328 | 120,147 | 129,342 | 148,732 | 1,534,031 |
| | Commercial | 78,481 | 78,370 | 72,151 | 72,549 | 72,646 | 70,889 | 74,235 | 80,235 | 79,091 | 87,240 | 77,183 | 80,540 | 923,610 |
| | Industrial | 535,198 | 507,080 | 517,064 | 521,683 | 524,102 | 499,228 | 509,589 | 489,343 | 464,671 | 493,165 | 497,404 | 470,212 | 6,028,739 |
| | Other | 20,146 | 22,016 | 24,030 | 22,554 | 22,192 | 22,161 | 24,076 | 24,744 | 20,763 | 20,118 | 21,019 | 19,914 | 263,733 |
| | **TOTAL** | **786,625** | **754,597** | **743,979** | **743,168** | **739,687** | **703,292** | **719,586** | **712,310** | **681,853** | **720,670** | **724,948** | **719,398** | **8,750,113** |
| 1971 | Residential | 171,644 | 157,263 | 138,901 | 135,619 | 123,858 | 117,446 | 118,165 | 122,788 | 129,015 | 124,349 | 136,480 | 157,000 | 1,632,528 |
| | Commercial | 87,202 | 83,537 | 78,458 | 78,899 | 78,903 | 76,350 | 78,401 | 82,514 | 85,580 | 92,637 | 80,452 | 86,892 | 989,825 |
| | Industrial | 512,277 | 490,144 | 496,830 | 510,798 | 528,034 | 528,014 | 454,859 | 428,468 | 378,792 | 519,353 | 551,435 | 600,152 | 5,999,156 |
| | Other | 21,318 | 22,036 | 21,285 | 23,467 | 23,067 | 21,581 | 22,505 | 24,363 | 21,012 | 21,838 | 22,599 | 23,406 | 268,477 |
| | **TOTAL** | **792,441** | **752,980** | **735,474** | **748,783** | **753,862** | **743,391** | **673,930** | **658,133** | **614,399** | **758,177** | **790,966** | **867,450** | **8,889,986** |
| 1972 | Residential | 196,308 | 174,977 | 159,083 | 139,973 | 129,697 | 129,433 | 126,990 | 125,023 | 134,719 | 131,454 | 146,473 | 174,196 | 1,768,326 |
| | Commercial | 99,573 | 98,759 | 85,723 | 82,667 | 80,349 | 85,918 | 84,421 | 84,408 | 91,807 | 91,910 | 87,636 | 96,428 | 1,069,599 |
| | Industrial | 383,841 | 367,497 | 547,387 | 532,198 | 531,324 | 484,725 | 494,943 | 480,897 | 475,312 | 492,458 | 470,817 | 398,909 | 5,660,308 |
| | Other | 22,537 | 21,683 | 23,962 | 22,315 | 22,021 | 22,468 | 20,535 | 22,039 | 21,171 | 21,633 | 21,567 | 22,610 | 264,541 |
| | **TOTAL** | **702,259** | **662,916** | **816,155** | **777,153** | **763,391** | **722,544** | **726,889** | **712,367** | **723,009** | **737,455** | **726,493** | **692,143** | **9,762,774** |
| 1973 | Residential | 196,308 | 174,977 | 155,431 | 145,404 | 136,810 | 131,440 | 134,731 | 138,222 | 142,991 | 134,836 | 151,242 | 169,992 | 1,812,384 |
| | Commercial | 99,573 | 98,759 | 91,616 | 89,892 | 88,813 | 89,850 | 94,218 | 99,168 | 98,973 | 89,397 | 92,215 | 92,810 | 1,125,284 |
| | Industrial | 383,841 | 367,497 | 429,807 | 429,508 | 391,416 | 370,707 | 384,180 | 428,935 | 434,784 | 466,258 | 478,403 | 468,563 | 5,033,899 |
| | Other | 22,537 | 21,683 | 22,045 | 21,664 | 21,123 | 20,615 | 20,508 | 20,327 | 18,181 | 18,956 | 18,528 | 19,528 | 245,695 |
| | **TOTAL** | **702,259** | **662,916** | **698,899** | **686,468** | **638,162** | **612,612** | **633,637** | **686,652** | **694,929** | **709,447** | **740,388** | **750,893** | **8,217,262** |
| 1974 | Residential | 185,102 | 178,463 | 154,353 | 152,674 | 139,598 | 142,545 | 146,882 | 156,208 | 145,167 | 141,631 | 154,677 | 175,550 | 1,872,850 |
| | Commercial | 98,697 | 97,157 | 90,171 | 91,900 | 86,088 | 91,539 | 98,340 | 104,597 | 96,879 | 103,383 | 95,650 | 102,055 | 1,156,456 |
| | Industrial | 492,483 | 491,482 | 504,374 | 447,331 | 439,410 | 450,886 | 507,271 | 511,013 | 504,551 | 545,501 | 546,527 | 487,813 | 5,928,642 |
| | Other | 20,837 | 21,098 | 21,008 | 19,541 | 19,077 | 17,505 | 16,576 | 16,611 | 14,336 | 16,962 | 13,771 | 15,859 | 213,181 |
| | **TOTAL** | **797,119** | **788,200** | **769,906** | **711,446** | **684,173** | **702,475** | **769,069** | **788,429** | **760,933** | **807,477** | **810,625** | **781,277** | **9,171,129** |
| 1975 | Residential | 197,113 | 197,400 | 185,873 | 172,523 | 162,091 | 150,032 | 154,294 | 164,663 | 160,058 | 144,833 | 170,283 | 198,560 | 2,057,723 |
| | Commercial | 106,850 | 109,601 | 105,285 | 97,526 | 100,689 | 97,171 | 102,615 | 110,064 | 103,845 | 116,764 | 102,254 | 97,590 | 1,250,254 |
| | Industrial | 502,334 | 468,418 | 444,306 | 423,351 | 420,191 | 394,480 | 391,641 | 384,746 | 402,479 | 413,633 | 438,613 | 385,277 | 5,069,469 |
| | Other | 16,027 | 16,803 | 16,816 | 15,749 | 15,943 | 17,103 | 16,433 | 17,883 | 15,282 | 16,100 | 16,484 | 16,730 | 197,353 |
| | **TOTAL** | **822,324** | **792,222** | **752,280** | **709,149** | **698,914** | **658,786** | **664,983** | **677,356** | **681,664** | **691,330** | **727,634** | **698,157** | **8,574,799** |
| 1976 | Residential | 241,286 | 224,354 | 215,650 | 188,027 | 172,354 | 155,076 | 159,897 | 163,718 | 163,180 | 161,084 | 188,024 | 227,972 | 2,260,622 |
| | Commercial | 135,656 | 120,033 | 138,292 | 125,658 | 117,737 | 118,578 | 123,076 | 127,036 | 127,802 | 123,816 | 128,418 | 139,325 | 1,525,427 |
| | Industrial | 430,307 | 417,454 | 418,118 | 422,976 | 475,160 | 524,969 | 536,980 | 509,190 | 242,368 | 534,606 | 553,161 | 536,896 | 5,602,185 |
| | Other | 18,228 | 18,619 | 17,927 | 17,454 | 17,249 | 16,683 | 15,884 | 31,570 | 347 | 15,931 | 16,427 | 16,754 | 203,073 |
| | **TOTAL** | **825,477** | **780,460** | **789,987** | **754,115** | **782,500** | **815,306** | **835,837** | **831,514** | **533,697** | **835,437** | **886,030** | **920,947** | **9,591,307** |
| 1977 | Residential | 253,749 | 258,803 | 217,115 | 212,474 | 182,513 | 171,838 | 162,720 | 166,556 | 174,463 | 179,015 | 196,996 | 263,448 | 2,439,690 |
| | Commercial | 140,085 | 147,674 | 134,726 | 133,308 | 127,309 | 129,217 | 129,935 | 136,898 | 137,011 | 129,616 | 129,696 | 149,868 | 1,625,343 |
| | Industrial | 554,502 | 506,893 | 503,940 | 501,779 | 477,528 | 458,817 | 452,227 | 444,899 | 460,422 | 451,969 | 480,088 | 466,145 | 5,759,209 |
| | Other | 17,478 | 17,568 | 16,518 | 15,764 | 15,859 | 15,444 | 15,119 | 14,947 | 14,773 | 14,735 | 14,955 | 15,918 | 189,078 |
| | **TOTAL** | **965,814** | **930,938** | **872,299** | **863,325** | **803,209** | **775,316** | **760,001** | **763,300** | **786,669** | **775,335** | **821,735** | **895,379** | **10,013,320** |
| 1978 | Residential | 303,487 | 304,192 | 273,393 | 225,954 | 203,167 | 186,810 | 176,290 | | | | | | |
| | Commercial | 156,693 | 159,381 | 153,436 | 142,065 | 132,248 | 133,658 | 141,128 | | | | | | |
| | Industrial | 500,632 | 493,841 | 510,198 | 500,102 | 482,065 | 488,834 | 518,796 | | | | | | |
| | Other | 16,742 | 17,803 | 17,714 | 16,386 | 15,924 | 14,134 | 15,197 | | | | | | |
| | **TOTAL** | **977,554** | **975,217** | **954,741** | **884,507** | **833,404** | **823,436** | **851,411** | | | | | | |

Source: U. S. Department of Energy, Energy Information Administration, *Electric Power Statistics*.

## TABLE 2.4
## ANNUAL SALES OF ELECTRICITY BY THE ELECTRIC UTILITY INDUSTRY IN MONTANA
## (million kWh)

| Year | Total Sales | Residential | Commercial | Industrial | Street & Highway Lighting | Other Public Sales | Railroads | Inter-departmental |
|---|---|---|---|---|---|---|---|---|
| 1950 | 2,351 | 378 | 219 | 1,559 | 16 | 15 | 154 | 11 |
| 1951 | 2,437 | 423 | 238 | 1,566 | 18 | 19 | 164 | 10 |
| 1952 | 2,699 | 484 | 256 | 1,757 | 20 | 17 | 159 | 6 |
| 1953 | 3,002 | 501 | 302 | 1,987 | 20 | 33 | 154 | 5 |
| 1954 | 2,772 | 562 | 351 | 1,649 | 24 | 33 | 145 | 8 |
| 1955 | 3,658 | 643 | 389 | 2,407 | 25 | 34 | 154 | 6 |
| 1956 | 4,666 | 720 | 416 | 3,309 | 26 | 37 | 153 | 5 |
| 1957 | 4,418 | 782 | 462 | 2,975 | 28 | 40 | 127 | 4 |
| 1958 | 4,268 | 810 | 474 | 2,796 | 29 | 43 | 108 | 8 |
| 1959 | 4,074 | 893 | 512 | 2,468 | 30 | 55 | 99 | 17 |
| 1960 | 4,617 | 935 | 529 | 2,973 | 33 | 52 | 89 | 6 |
| 1961 | 4,774 | 953 | 603 | 3,028 | 33 | 69 | 83 | 5 |
| 1962 | 5,044 | 1,024 | 652 | 3,152 | 36 | 82 | 91 | 7 |
| 1963 | 5,192 | 1,055 | 715 | 3,190 | 36 | 102 | 88 | 6 |
| 1964 | 5,647 | 1,117 | 772 | 3,534 | 39 | 105 | 75 | 5 |
| 1965 | 6,228 | 1,172 | 846 | 3,965 | 40 | 114 | 85 | 6 |
| 1966 | 7,076 | 1,207 | 894 | 4,718 | 43 | 121 | 88 | 6 |
| 1967 | 6,866 | 1,310 | 936 | 4,338 | 43 | 144 | 82 | 13 |
| 1968 | 7,741 | 1,385 | 1,027 | 5,055 | 47 | 140 | 69 | 18 |
| 1969 | 9,152 | 1,469 | 1,117 | 6,316 | 51 | 123 | 57 | 19 |
| 1970 | 9,091 | 1,521 | 1,188 | 6,120 | 52 | 117 | 73 | 20 |
| 1971 | 9,214 | 1,614 | 1,254 | 6,079 | 53 | 113 | 80 | 21 |
| 1972 | 9,191 | 1,710 | 1,325 | 5,888 | 53 | 113 | 81 | 21 |
| 1973 | 8,572 | 1,852 | 1,447 | 5,031 | 55 | 117 | 52 | 18 |
| 1974 | 9,540 | 1,877 | 1,488 | 5,963 | 57 | 113 | 23 | 19 |
| 1975 | 8,867 | 2,038 | 1,544 | 5,089 | 64 | 113 | -- | 19 |
| 1976 | 9,891 | 2,232 | 1,669 | 5,795 | 60 | 115 | -- | 20 |
| 1977 | 10,036 | 2,433 | 2,225 | 5,195 | 60 | 101 | -- | 22 |

Source: Edison Electric Institute, *Statistical Yearbook of the Electric Utility Industry*, various years.

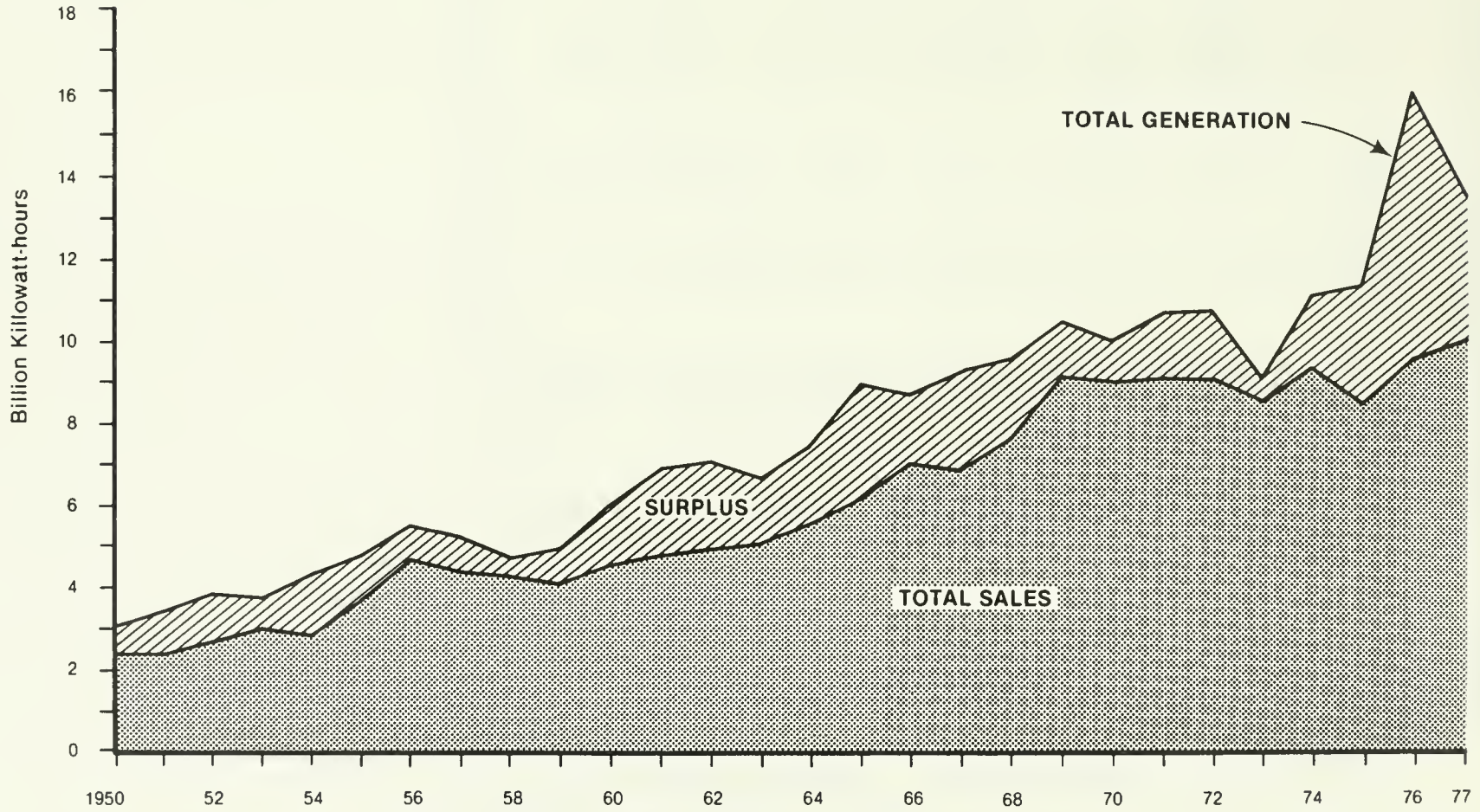



FIGURE 2.3 ANNUAL GENERATION AND SALES OF ELECTRICITY IN MONTANA, 1950-77

## TABLE 2.5
## AVERAGE ANNUAL PRICES FOR ELECTRICITY SOLD IN MONTANA
## (cents/kWh)

| Year | Total Sales | Residential | Commercial | Industrial | Street & Highway Lighting | Other Public Sales | Railroads | Inter-departmental |
|---|---|---|---|---|---|---|---|---|
| 1950 | 1.06 | 2.70 | 2.42 | 0.50 | 2.41 | 0.84 | 0.57 | 0.54 |
| 1951 | 1.08 | 2.66 | 2.37 | 0.51 | 2.32 | 0.73 | 0.54 | 0.56 |
| 1952 | 1.08 | 2.60 | 2.39 | 0.50 | 2.28 | 0.80 | 0.54 | 0.82 |
| 1953 | 1.03 | 2.52 | 2.42 | 0.47 | 2.35 | 0.52 | 0.54 | 0.88 |
| 1954 | 1.14 | 2.44 | 2.37 | 0.48 | 2.18 | 0.58 | 0.54 | 0.73 |
| 1955 | 0.99 | 2.34 | 2.32 | 0.43 | 2.25 | 0.60 | 0.54 | 0.92 |
| 1956 | 0.86 | 2.34 | 2.17 | 0.38 | 2.32 | 0.65 | 0.55 | 1.10 |
| 1957 | 0.93 | 2.28 | 2.08 | 0.40 | 2.30 | 0.66 | 0.54 | 1.38 |
| 1958 | 0.99 | 2.34 | 2.15 | 0.41 | 2.39 | 0.67 | 0.54 | 0.88 |
| 1959 | 1.10 | 2.37 | 2.22 | 0.43 | 2.56 | 0.70 | 0.55 | 0.59 |
| 1960 | 1.05 | 2.33 | 2.25 | 0.43 | 2.45 | 0.79 | 0.56 | 1.27 |
| 1961 | 1.06 | 2.32 | 2.18 | 0.45 | 2.70 | 0.74 | 0.55 | 1.70 |
| 1962 | 1.07 | 2.29 | 2.13 | 0.46 | 2.50 | 0.61 | 0.55 | 1.43 |
| 1963 | 1.07 | 2.25 | 2.06 | 0.45 | 2.78 | 0.78 | 0.57 | 1.67 |
| 1964 | 1.03 | 2.20 | 2.02 | 0.45 | 2.56 | 0.71 | 0.53 | 2.00 |
| 1965 | 0.98 | 2.12 | 1.93 | 0.44 | 2.75 | 0.70 | 0.59 | 1.67 |
| 1966 | 0.92 | 2.09 | 1.92 | 0.43 | 2.56 | 0.66 | 0.57 | 1.67 |
| 1967 | 0.95 | 2.04 | 1.89 | 0.42 | 2.79 | 0.63 | 0.49 | 1.08 |
| 1968 | 0.90 | 1.99 | 1.83 | 0.40 | 2.77 | 0.61 | 0.58 | 1.11 |
| 1969 | 0.88 | 2.10 | 1.93 | 0.41 | 2.75 | 0.57 | 0.53 | 1.05 |
| 1970 | 0.94 | 2.13 | 1.94 | 0.42 | 2.88 | 0.60 | 0.55 | 1.00 |
| 1971 | 0.95 | 2.12 | 1.94 | 0.43 | 3.02 | 0.62 | 0.50 | 0.95 |
| 1972 | 1.00 | 2.16 | 1.98 | 0.44 | 3.21 | 0.53 | 0.49 | 1.19 |
| 1973 | 1.16 | 2.21 | 2.04 | 0.53 | 3.27 | 0.60 | 0.58 | 1.67 |
| 1974 | 1.10 | 2.23 | 2.05 | 0.50 | 3.23 | 0.58 | 0.53 | 1.41 |
| 1975 | 1.25 | 2.19 | 2.08 | 0.62 | 2.99 | 0.58 | 0.00 | 1.51 |
| 1976 | 1.24 | 2.23 | 2.06 | 0.60 | 3.32 | 0.73 | 0.00 | 1.67 |
| 1977 | 1.38 | 2.38 | 1.90 | 0.67 | 3.53 | 0.80 | 0.00 | 1.79 |

Source: Edison Electric Institute, *Statistical Yearbook of the Electric Utility Industry*, various years.
Note: Average annual prices were calculated by dividing total revenues by total sales.

## TABLE 2.6
## INDUSTRIAL CONSUMPTION OF ELECTRICITY IN MONTANA BY SIC CODE, 1976 AND 1977

| Industry | SIC Code | 1976 (1000 kWh) | 1976 % of Total | 1977 (1000 kWh) | 1977 % of Total |
|---|---|---|---|---|---|
| **MINING** | | | | | |
| Metal Mining | 10 | [1] | [1] | 233,380 | 4.2 |
| Bituminous Coal, Lignite Mining | 12 | [1] | [1] | [1] | [1] |
| Crude Petroleum, Natural Gas | 13 | 194,452 | 3.6 | 193,426 | 3.5 |
| Nonmetallic Mineral Mining | 14 | 44,872 | 0.8 | 49,120 | 0.9 |
| **CONSTRUCTION** | | | | | |
| Construction Other than Building Construction | 16 | [1] | [1] | [1] | [1] |
| **MANUFACTURING** | | | | | |
| Food and Kindred Products | 20 | 64,755 | 1.2 | 69,999 | 1.3 |
| Lumber and Wood Products | 24 | 292,440 | 5.5 | 320,798 | 5.8 |
| Furniture and Fixtures | 25 | [1] | [1] | [1] | [1] |
| Paper and Allied Products | 26 | [1] | [1] | [1] | [1] |
| Printing and Publishing | 27 | 6,977 | 0.1 | 7,242 | 0.1 |
| Chemical Products | 28 | 456,759 | 8.5 | 470,337 | 8.5 |
| Petroleum Products | 29 | 289,415 | 5.4 | 356,770 | 6.4 |
| Leather and Leather Products | 31 | [1] | [1] | [1] | [1] |
| Stone, Clay, Glass, Concrete | 32 | 90,552 | 1.7 | 90,383 | 1.6 |
| Primary Metals | 33 | 3,446,846 | 64.4 | 3,595,952 | 64.7 |
| Fabricated Metals | 34 | 1,132 | 0.02 | 1,232 | 0.02 |
| Machinery (Nonelectric) | 35 | 887 | 0.02 | 620 | 0.01 |
| Transportation Equipment | 37 | 1,120 | 0.02 | 1,142 | 0.02 |
| Measuring, analyzing, and controlling instruments; etc. | 38 | [1] | [1] | [1] | [1] |
| **ALL OTHER** | [1] | 461,127 | 8.6 | 167,703 | 3.0 |
| **TOTAL** | | **5,351,334** | **100.0** | **5,558,105** | **100.0** |

Source: Research Department, Federal Reserve Bank of Minneapolis.
[1]Combined in "ALL OTHER" to avoid disclosure of individual firms.

## TABLE 2.7
## CONSUMPTION OF FUELS BY ELECTRIC UTILITIES IN MONTANA

| Year | Fuel | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1960 | Coal | 22.6 | 20.0 | 21.3 | 15.2 | 14.2 | 4.8 | 13.5 | 14.7 | 9.1 | 11.9 | 15.7 | 23.9 | 186.9 |
| | Oil | 0.0 | ' | ' | ' | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ' |
| | Gas | 51.1 | 44.0 | 52.8 | 49.0 | 25.8 | 16.7 | 7.7 | 9.2 | 12.1 | 7.3 | 17.1 | 48.5 | 341.3 |
| 1961 | Coal | 24.1 | 19.8 | 25.6 | 21.9 | 25.0 | 5.6 | 20.1 | 23.9 | 18.3 | 23.1 | 24.7 | 30.4 | 262.5 |
| | Oil | 0.0 | 0.0 | 0.0 | ' | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ' |
| | Gas | 30.2 | 24.6 | 18.9 | 18.0 | 8.2 | 7.7 | 7.3 | 9.9 | 6.3 | 17.6 | 9.2 | 198.2 | 356.2 |
| 1962 | Coal | 29.5 | 25.7 | 29.3 | 23.3 | 26.2 | 11.7 | 21.8 | 23.9 | 19.9 | 26.4 | 23.6 | 30.3 | 291.6 |
| | Oil | 0.9 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 |
| | Gas | 329.0 | 312.4 | 396.4 | 374.2 | 148.1 | 100.7 | 6.7 | 308.7 | 488.0 | 506.3 | 485.2 | 256.8 | 3,712.5 |
| 1963 | Coal | 31.8 | 27.1 | 26.2 | 27.3 | 29.0 | 3.5 | 24.4 | 25.9 | 17.3 | 25.5 | 22.4 | 25.1 | 285.5 |
| | Oil | 0.6 | 0.0 | 0.0 | 0.0 | ' | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 |
| | Gas | 341.7 | 220.0 | 275.3 | 263.3 | 28.6 | 160.2 | 209.0 | 351.2 | 413.7 | 363.8 | 308.2 | 368.3 | 3,303.3 |
| 1964 | Coal | 21.8 | 19.9 | 25.3 | 21.5 | 24.5 | 28.0 | 25.7 | 23.9 | 18.7 | 24.8 | 26.2 | 33.5 | 293.8 |
| | Oil | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.8 | 3.6 |
| | Gas | 213.7 | 202.8 | 213.8 | 200.7 | 58.9 | 132.8 | 194.3 | 237.9 | 283.2 | 276.4 | 186.3 | 248.7 | 2,449.5 |
| 1965 | Coal | 29.4 | 24.4 | 28.2 | 28.6 | 21.1 | 23.0 | 25.5 | 12.3 | 26.6 | 26.0 | 27.2 | 23.5 | 295.8 |
| | Oil | 0.0 | ' | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | ' | 0.3 | 0.0 | 0.0 | 0.2 | 0.7 |
| | Gas | 199.3 | 176.8 | 187.6 | 173.0 | 5.7 | 115.8 | 163.6 | 179.4 | 185.4 | 185.2 | 191.6 | 228.9 | 1,992.3 |
| 1966 | Coal | 31.9 | 29.5 | 24.8 | 27.4 | 30.3 | 27.0 | 29.1 | 12.8 | 25.1 | 28.7 | 27.8 | 29.1 | 323.5 |
| | Oil | 0.5 | 0.0 | 1.3 | 0.4 | 0.3 | 0.1 | 3.3 | 24.0 | 20.8 | 20.9 | 10.6 | 0.0 | 82.2 |
| | Gas | 225.9 | 192.0 | 209.7 | 189.3 | 217.9 | 161.0 | 260.1 | 267.3 | 241.1 | 297.5 | 408.4 | 307.0 | 2,977.2 |
| 1967 | Coal | 29.8 | 29.0 | 28.6 | 24.8 | 27.0 | 19.8 | 20.9 | 27.6 | 28.8 | 27.8 | 27.8 | 33.5 | 325.4 |
| | Oil | ' | 2.0 | 4.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ' | 0.0 | ' | 0.0 | 6.1 |
| | Gas | 223.0 | 171.8 | 56.5 | 12.0 | 3.7 | 6.6 | 5.3 | 4.3 | 3.1 | 6.5 | 4.9 | 4.8 | 502.5 |
| 1968 | Coal | 34.4 | 29.6 | 25.1 | 29.7 | 28.7 | 28.6 | 25.7 | 19.9 | 33.9 | 56.5 | 37.8 | 49.3 | 399.2 |
| | Oil | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | ' | 8.2 | 3.2 | 0.0 | ' | 3.3 | 8.1 | 22.9 |
| | Gas | 7.5 | 2.9 | 3.7 | 1.8 | 3.8 | 2.8 | 97.4 | 142.3 | 30.0 | 85.6 | 120.1 | 133.4 | 631.3 |
| 1969 | Coal | 56.9 | 52.9 | 56.9 | 47.6 | 30.3 | 27.8 | 44.8 | 35.6 | 77.6 | 44.2 | 41.5 | 57.8 | 576.6 |
| | Oil | 11.9 | 1.5 | 5.5 | 0.0 | 3.4 | 2.8 | 1.3 | 0.5 | 0.0 | 37.1 | 25.5 | 15.4 | 104.9 |
| | Gas | 149.4 | 91.3 | 115.4 | 82.2 | 138.9 | 177.4 | 123.3 | 86.2 | 92.3 | 178.2 | 149.2 | 136.7 | 1,520.5 |
| 1970 | Coal | 82.4 | 56.9 | 67.5 | 51.2 | 36.9 | 25.5 | 29.6 | 33.3 | 67.0 | 89.7 | 91.1 | 91.6 | 722.7 |
| | Oil | 13.0 | 11.3 | 1.4 | 0.0 | ' | 0.1 | 0.1 | 0.0 | 0.0 | ' | 0.0 | ' | 26.0 |
| | Gas | 159.7 | 126.5 | 106.4 | 94.5 | 160.2 | 197.2 | 294.7 | 141.4 | 70.3 | 106.0 | 457.6 | 614.9 | 2,529.4 |
| 1971 | Coal | 92.0 | 60.5 | 58.3 | 48.4 | 43.3 | 44.4 | 33.9 | 15.7 | 30.3 | 71.0 | 87.5 | 86.7 | 672.0 |
| | Oil | ' | 0.1 | ' | 0.0 | ' | ' | ' | 0.0 | 0.0 | ' | 0.0 | 0.0 | 0.2 |
| | Gas | 279.3 | 76.8 | 68.7 | 58.4 | 150.3 | 123.1 | 15.4 | 4.0 | 17.0 | 61.3 | 79.3 | 146.2 | 1,079.8 |
| 1972 | Coal | 86.6 | 75.1 | 55.2 | 55.7 | 30.8 | 43.1 | 64.3 | 67.1 | 43.9 | 77.8 | 74.4 | 94.7 | 768.7 |
| | Oil | 1.6 | ' | ' | 0.0 | ' | ' | ' | ' | ' | 0.9 | 0.2 | 14.6 | 17.5 |
| | Gas | 83.1 | 54.0 | 64.0 | 40.9 | 49.1 | 74.4 | 100.1 | 95.2 | 50.8 | 91.7 | 224.7 | 289.4 | 1,217.4 |
| 1973 | Coal | 85.6 | 69.0 | 76.3 | 92.1 | 94.3 | 26.0 | 50.9 | 91.6 | 53.0 | 74.7 | 87.6 | 91.5 | 892.6 |
| | Oil | 1.8 | 0.2 | 0.1 | 9.2 | 24.8 | 0.4 | 8.1 | 18.4 | 0.2 | 50.1 | 38.8 | 0.1 | 152.2 |
| | Gas | 326.3 | 233.7 | 198.4 | 185.3 | 177.8 | 99.8 | 0.0 | 191.0 | 166.0 | 271.8 | 178.0 | 139.3 | 2,167.4 |

## TABLE 2.7 (continued)
## CONSUMPTION OF FUELS BY ELECTRIC UTILITIES IN MONTANA

| Year | Fuel | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1974 | Coal | 79.8 | 78.3 | 73.6 | 65.1 | 61.2 | 18.8 | 63.4 | 72.9 | 77.5 | 83.7 | 89.5 | 90.8 | 854.6 |
| | Oil | 10.6 | [1] | [1] | [1] | 0.3 | [1] | [1] | [1] | [1] | [1] | [1] | 2.9 | 14.0 |
| | Gas | 206.6 | 92.8 | 109.6 | 106.7 | 69.8 | 54.7 | 7.2 | 51.5 | 55.5 | 111.8 | 82.8 | 89.0 | 1,038.0 |
| 1975 | Coal | 83.2 | 78.7 | 88.3 | 88.8 | 76.4 | 47.3 | 61.8 | 70.8 | 59.3 | 84.5 | 145.8 | 176.3 | 1,061.3 |
| | Oil | 1.9 | [1] | [1] | [1] | 0.1 | [1] | [1] | [1] | 14.2 | 17.8 | 10.1 | 18.3 | 62.6 |
| | Gas | 148.0 | 113.5 | 90.5 | 51.4 | 50.0 | 64.0 | 171.3 | 104.9 | 105.0 | 56.6 | 47.6 | 70.6 | 1,073.3 |
| 1976 | Coal | 193.1 | 175.6 | 179.8 | 140.8 | 91.8 | 94.6 | 145.7 | 146.8 | 268.2 | 326.1 | 287.9 | 323.1 | 2,373.5 |
| | Oil | 6.3 | 6.2 | 5.2 | 6.3 | 1.0 | 7.6 | 11.2 | 10.2 | 5.4 | 7.3 | 9.4 | 4.5 | 80.6 |
| | Gas | 58.7 | 47.5 | 51.5 | 39.2 | 28.5 | 43.6 | 70.4 | 70.4 | 49.8 | 113.3 | 61.1 | 74.5 | 708.5 |
| 1977 | Coal | 315.1 | 188.7 | 192.7 | 262.7 | 188.1 | 266.3 | 288.2 | 286.0 | 320.2 | 245.9 | 284.8 | 357.8 | 3,196.5 |
| | Oil | 9.6 | 3.9 | 10.8 | 72.0 | 27.3 | 7.1 | 24.7 | 23.0 | 1.1 | 3.5 | 6.6 | 5.6 | 195.2 |
| | Gas | 87.6 | 38.8 | 56.9 | 106.7 | 36.8 | 45.1 | 119.7 | 229.2 | 35.5 | 75.2 | 73.1 | 48.7 | 953.3 |

Note: Units: Coal = 1000 tons, Oil = 1000 barrels, Gas = 1000 MCF
Source: U. S. Department of Energy, Energy Information Administration, *Electric Power Statistics.*
[1]less than 0.1

3

# COAL

## HIGHLIGHTS

- Surface mines in Montana produced 27,229,052 tons of subbituminous coal and lignite in 1977, up 4 percent from 1976.
- Big Horn County was again the top coal-producing county in 1977 with 14,768,368 tons. Rosebud County remained in second place with a production of 12,117,552 tons.
- The average mine-mouth price for Montana coal in 1977 was $5.83 per ton compared with $5.72 per ton in 1976.
- Shipments of Montana coal to out-of-state destinations amounted to 89 percent of the total production in 1977.
- The total coal production in 1978, 26.7 million tons, was down 3 percent from 1977. A major reason for the decline was a shortage of railroad cars during 1978.

## TABLES


| Table | | Page |
|---|---|---|
| 3.1 | Total Estimated Remaining Identified Resources of Coal and Lignite by State | 24 |
| 3.2 | Montana Coal Production, by Company, by Month, 1978 | 25 |
| 3.3 | Montana Coal Production, by County | 26 |
| 3.4 | Montana Coal Production and Average Mine-mouth Prices by Type of Coal | 28 |
| 3.5 | Summary of Receipts of Montana and Wyoming Coal by Electric Utility Plants | 29 |
| 3.6 | Average Mine-mouth Coal Prices in Montana, by County | 30 |
| 3.7 | Distribution of Coal Produced in Montana, Wyoming, and North Dakota in 1976 and 1977, by State of Destination | 32 |
| 3.8 | Distribution of Coal in Montana | 33 |

## TABLE 3.1
## TOTAL ESTIMATED REMAINING IDENTIFIED RESOURCES OF COAL AND LIGNITE BY STATE JANUARY 1, 1974[1]
## (billions of short tons)

| State | Anthracite and Semianthracite | Subbituminuous | Bituminous | Lignite | Total Coal and Lignite |
|---|---|---|---|---|---|
| Alabama | | | 13.3 | 2.0 | 15.3 |
| Alaska | | 110.7 | 19.4 | | 130.1 |
| Arizona | | | 21.2 | | 21.2 |
| Arkansas | 0.4 | | 1.6 | 0.4 | 2.4 |
| Colorado | 0.1 | 19.7 | 109.1 | [2] | 128.9 |
| Georgia | | | [2] | | [2] |
| Illinois | | | 146.0 | | 146.0 |
| Indiana | | | 32.9 | | 32.9 |
| Iowa | | | 6.5 | | 6.5 |
| Kansas | | | 18.7 | | 18.7 |
| Kentucky | | | 64.3 | | 64.3 |
| Maryland | | | 1.2 | | 1.2 |
| Michigan | | | 0.2 | | 0.2 |
| Missouri | | | 31.2 | | 31.2 |
| **Montana** | | **36.4** | **2.3** | **23.5** | **291.6** |
| New Mexico | [2] | 50.6 | 10.7 | | 61.4 |
| North Carolina | | | 0.1 | | 0.1 |
| North Dakota | | | | 350.6 | 350.6 |
| Ohio | | | 41.2 | | 41.2 |
| Oklahoma | | | 7.1 | | 7.1 |
| Oregon | | 0.3 | [2] | | 0.3 |
| Pennsylvania | 18.8 | | 63.9 | | 82.8 |
| South Dakota | | | | 2.2 | 2.2 |
| Tennessee | | | 2.5 | | 2.5 |
| Texas | | | 6.0 | 10.3 | 16.3 |
| Utah | | 0.2 | 23.2 | | 23.4 |
| Virginia | 0.3 | | 9.2 | | 9.6 |
| Washington | [2] | 4.2 | 1.9 | 0.1 | 6.2 |
| West Virginia | | | 100.1 | | 100.1 |
| Wyoming | | 123.2 | 12.7 | | 135.9 |
| Other States | | [2 4] | 0.6[5] | [2 6] | 0.7[3] |
| **TOTAL UNITED STATES** | **19.7** | **485.8** | **747.3** | **478.1** | **1,730.9** |

Source: U. S. Department of the Interior, *Coal Resources of the United States*, January 1, 1974 (Bulletin 1412).

[1]Figures are for resources in the ground, about half of which may be considered recoverable. Includes beds of bituminous coal and anthracite 14 in. or more thick and beds of subbituminous coal and lignite 2½ feet or more thick.

[2]Less than 50 million short tons.

[3]Includes California, Idaho, Louisiana, Mississippi, Nebraska and Nevada.

[4]Includes California and Idaho.

[5]Includes California, Idaho, Nebraska and Nevada.

[6]Includes California, Idaho, Mississippi and Nevada.

## TABLE 3.2
## MONTANA COAL PRODUCTION, BY COMPANY, BY MONTH, 1978

| | P. M. Coal Mining Co. | Coal Creek Strip | Monthly Total |
|---|---|---|---|
| 7 | 1,878 | 1,230 | 1,692,165 |
| 4 | 1,346 | 487 | 1,347,240 |
| 9 | 750 | 201 | 2,488,217 |
| 7 | 294 | 11 | 2,552,051 |
| 4 | 200 | 0 | 2,502,861 |
| 6 | 39 | 40 | 2,117,953 |
| 3 | 0 | 143 | 2,580,678 |
| 2 | 187 | 178 | 2,330,694 |
| 0 | 570 | 314 | 2,162,414 |
| 0 | 1,103 | 1,857 | 2,165,253 |
| 1 | 1,700 | 1,219 | 2,134,884 |
| 7 | 1,810 | 2,565 | 2,604,764 |
| **0** | **9,877** | **8,245** | **26,679,174** |

fety and Health Bureau.

E R R A T A

Table 3.1, page 24, Total Estimated Remaining Identified Resources of Coal and Lignite by State, January 1, 1974 reads:

| State | Anthracite and Semianthracite | Subbituminous | Bituminous | Lignite | Total Coal and Lignite |
|---|---|---|---|---|---|
| Montana | 36.4 | 2.3 | 23.5 | 291.6 | |

The correct figures are:

| | | | | | |
|---|---|---|---|---|---|
| Montana | 176.8 | 2.3 | 112.5 | 291.6 | |

## TABLE 3.1

## TOTAL ESTIMATED REMAI[illegible] IDENTIFIED RESOURCES OF COAL AND LIGNITE BY STATE

| State | [illegible] |
|---|---|
| Alabama | |
| Alaska | |
| Arizona | |
| Arkansas | |
| Colorado | |
| Georgia | |
| Illinois | |
| Indiana | |
| Iowa | |
| Kansas | |
| Kentucky | |
| Maryland | |
| Michigan | |
| Missouri | |
| **Montana** | |
| New Mexico | |
| North Carolina | |
| North Dakota | |
| Ohio | |
| Oklahoma | |
| Oregon | |
| Pennsylvania | |
| South Dakota | |
| Tennessee | |
| Texas | |
| Utah | |
| Virginia | |
| Washington | |
| West Virginia | |
| Wyoming | |
| Other States | |
| **TOTAL UNITED STATES** | |

Source: U. S. Department of the Interior, C[illegible]
[1]Figures are for resources in the ground, abou
cite 14 in. or more thick and beds of subbitu
[2]Less than 50 million short tons.
[3]Includes California, Idaho, Louisiana, Missis
[4]Includes California and Idaho.
[5]Includes California, Idaho, Nebraska and Ne
[6]Includes California, Idaho, Mississippi and N

## TABLE 3.2
## MONTANA COAL PRODUCTION, BY COMPANY, BY MONTH, 1978

| Month | Divide | Decker Coal Co. | Peabody Coal Co. | Westmore-land Coal Co. | Knife River Coal Mining Co. | Western Energy | P. M. Coal Mining Co. | Coal Creek Strip | Monthly Total |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 1,332 | 549,008 | 118,534 | 237,394 | 29,212 | 753,577 | 1,878 | 1,230 | 1,692,165 |
| Feb. | 1,180 | 479,513 | 99,407 | 174,883 | 26,040 | 564,284 | 1,346 | 487 | 1,347,240 |
| Mar. | 685 | 743,086 | 165,048 | 417,214 | 28,304 | 1,132,929 | 750 | 201 | 2,488,217 |
| April | 209 | 679,437 | 205,958 | 553,967 | 24,388 | 1,087,787 | 294 | 11 | 2,552,051 |
| May | 140 | 674,034 | 224,928 | 551,860 | 24,635 | 1,027,064 | 200 | 0 | 2,502,861 |
| June | 427 | 601,374 | 163,599 | 417,098 | 0 | 935,376 | 39 | 40 | 2,117,953 |
| July | 6 | 1,057,465 | 182,494 | 407,097 | 17,750 | 915,723 | 0 | 143 | 2,580,678 |
| August | 0 | 670,834 | 208,020 | 544,973 | 30,030 | 876,472 | 187 | 178 | 2,330,694 |
| Sept. | 742 | 761,296 | 153,854 | 470,398 | 24,850 | 750,390 | 570 | 314 | 2,162,414 |
| Oct. | 1,033 | 766,995 | 205,394 | 314,437 | 33,374 | 841,060 | 1,103 | 1,857 | 2,165,253 |
| Nov. | 1,565 | 888,547 | 185,063 | 283,171 | 23,008 | 795,611 | 1,700 | 1,219 | 2,134,884 |
| Dec. | 1,665 | 1,296,049 | 168,115 | 221,966 | 27,117 | 885,477 | 1,810 | 2,565 | 2,604,764 |
| **ANNUAL TOTALS** | **8,984** | **9,167,638** | **2,080,414** | **4,549,558** | **288,708** | **10,565,750** | **9,877** | **8,245** | **26,679,174** |

Source: Montana Department of Labor and Industry, Workmen's Compensation Division, Safety and Health Bureau.

## TABLE 3.3
## MONTANA COAL PRODUCTION, BY COUNTY
## (tons)

| Year | Big Horn | Carbon | Cascade | Custer | Dawson | Fallon | Garfield | McCone |
|---|---|---|---|---|---|---|---|---|
| 1950 | | 198,781 | 21,306 | 5,618 | 7,657 | | 563 | 1,646 |
| 1951 | | 152,095 | 18,106 | 2,447 | 7,657 | 93 | 500 | |
| 1952 | | 122,771 | 2,278 | 1,441 | 6,326 | | 413 | |
| 1953 | | 56,942 | 1,086 | 940 | 4,579 | | | |
| 1954 | | 19,716 | 2,225 | 1,080 | 3,006 | | | 59 |
| 1955 | | 20,017 | 1,252 | 233 | 3,780 | | | |
| 1956 | | 17,025 | 2,132 | | 1,819 | | | 25 |
| 1957 | | 15,053 | 2,095 | | 2,734 | | | 965 |
| 1958 | | 10,906 | 1,816 | | 2,393 | | | 513 |
| 1959 | | 12,814 | 1,923 | | 2,502 | | | 279 |
| 1960 | | 11,085 | 1,650 | | 1,920 | | | 366 |
| 1961 | | 9,962 | 1,477 | | 1,313 | | | 1,091 |
| 1962 | | 11,363 | 1,444 | | 1,242 | | | 468 |
| 1963 | | 12,514 | 570 | | 1,477 | | | 335 |
| 1964 | | 12,023 | | | 987 | | | 316 |
| 1965 | | 25,684 | | | 1,217 | | | 142 |
| 1966 | | 52,811 | | | 767 | | | 254 |
| 1967 | | | | | 770 | | | 196 |
| 1968 | | | | | 266 | | | 163 |
| 1969 | | | | | 160 | | | 165 |
| 1970 | 74,856 | | | | 744 | | | 229 |
| 1971 | | | | | 127 | | | |
| 1972 | 792,949 | | | | 340 | | | |
| 1973 | 4,159,287 | | | | 242 | | | |
| 1974 | 8,332,038 | | | | 373 | | | |
| 1975 | 13,331,433 | | | | | | | |
| 1976 | 14,291,542 | | | | | | | |
| 1977 | 14,768,368 | | | | | | | |

Note: Average price was calculated by dividing gross value of production by total production for each county.

## TABLE 3.3 (continued)
## MONTANA COAL PRODUCTION, BY COUNTY
## (tons)

| Year | Musselshell | Powder River | Prairie | Richland | Rosebud | Sheridan | Valley | State Total |
|---|---|---|---|---|---|---|---|---|
| 1950 | 523,582 | 3,838 | 851 | 12,072 | 1,708,869 | 8,882 | 156 | 2,493,821 |
| 1951 | 593,030 | 3,772 | 1,950 | 12,956 | 1,488,300 | | 329 | 2,281,235 |
| 1952 | 502,533 | 2,573 | 1,213 | 14,589 | 1,406,321 | 6,862 | 99 | 2,067,419 |
| 1953 | 370,745 | 1,273 | 900 | 10,478 | 1,421,140 | | | 1,868,083 |
| 1954 | 345,474 | 2,160 | 213 | 10,156 | 1,083,311 | 7,406 | | 1,474,806 |
| 1955 | 366,086 | | | 1,444 | 795,955 | 7,541 | | 1,196,308 |
| 1956 | 347,126 | 1,858 | 336 | 5,420 | 952,080 | 6,601 | | 1,334,422 |
| 1957 | 199,652 | 2,557 | 614 | 1,527 | 164,311 | 5,195 | | 394,703 |
| 1958 | 220,606 | 4,711 | 307 | 76,218 | 19,241 | 2,125 | | 338,836 |
| 1959 | 135,117 | 1,517 | 313 | 177,972 | | 5,429 | | 337,866 |
| 1960 | 91,819 | 820 | | 188,820 | | 4,793 | | 301,273 |
| 1961 | 75,060 | 1,760 | | 264,108 | | 4,077 | | 358,848 |
| 1962 | 48,565 | 2,080 | | 297,013 | | 3,675 | | 365,850 |
| 1963 | 31,044 | 2,258 | | 285,697 | | 2,653 | | 336,548 |
| 1964 | 31,836 | 2,535 | | 294,463 | | 2,476 | | 344,636 |
| 1965 | 47,592 | 2,107 | | 298,315 | | 2,191 | | 377,248 |
| 1966 | 32,752 | 1,787 | | 325,348 | | 1,691 | | 415,410 |
| 1967 | 33,481 | 2,128 | | 326,757 | | 1,177 | | 364,509 |
| 1968 | 31,637 | 1,853 | | 329,022 | 192,029 | 301 | | 555,271 |
| 1969 | 30,540 | 2,047 | | 306,833 | 685,140 | | | 1,024,885 |
| 1970 | 26,675 | 3,053 | | 321,908 | 3,089,693 | | | 3,517,158 |
| 1971 | 112,252 | 2,660 | | 325,475 | 6,656,612 | | | 7,097,126 |
| 1972 | 46,460 | 1,727 | | 320,975 | 7,101,954 | | | 8,264,405 |
| 1973 | 29,837 | 1,444 | | 312,785 | 6,225,424 | | | 10,729,019 |
| 1974 | 20,669 | 1,001 | | 329,590 | 5,440,384 | | | 14,124,055 |
| 1975 | 16,524 | 1,862 | | 300,053 | 8,511,226 | | | 22,161,098 |
| 1976 | 15,709 | 1,614 | | 314,814 | 11,662,052 | | | 26,285,731 |
| 1977 | 15,727 | 16,015 | | 311,390 | 12,117,552 | | | 27,229,052 |

Source: Montana Department of Revenue, Property Assessment Division.

## TABLE 3.4
## MONTANA COAL PRODUCTION AND AVERAGE MINE-MOUTH PRICES BY TYPE OF COAL

| Year | PRODUCTION (1000 Tons) | | | AVERAGE MINE-MOUTH PRICE ($/Ton) | | |
|---|---|---|---|---|---|---|
| | Subbituminous | Lignite | Total | Subbituminous | Lignite | Total |
| 1950 | 2,468 | 52 | 2,520 | 2.30 | 3.37 | 2.33 |
| 1951 | 2,310 | 35 | 2,345 | 2.61 | 3.51 | 2.63 |
| 1952 | 2,039 | 31 | 2,070 | 2.80 | 3.70 | 2.81 |
| 1953 | 1,848 | 25 | 1,873 | 2.64 | 3.77 | 2.66 |
| 1954 | 1,491 | NA | NA | 2.79 | NA | NA |
| 1955 | 1,217 | 30 | 1,247 | 3.01 | 3.82 | 3.03 |
| 1956 | 820 | 26 | 846 | 4.11 | 3.70 | 4.10 |
| 1957 | 387 | 26 | 413 | 5.33 | 3.80 | 5.23 |
| 1958 | 211 | 94 | 305 | 5.94 | 2.34 | 4.84 |
| 1959 | 152 | 193 | 345 | 7.06 | 2.08 | 4.28 |
| 1960 | 113 | 200 | 313 | 6.87 | 2.06 | 3.79 |
| 1961 | 97 | 274 | 371 | 6.76 | 2.01 | 3.26 |
| 1962 | 78 | 304 | 382 | 6.90 | 1.99 | 2.98 |
| 1963 | 53 | 290 | 343 | 7.51 | 1.95 | 2.82 |
| 1964 | 46 | 300 | 346 | 7.40 | 1.95 | 2.68 |
| 1965 | 63 | 301 | 364 | 7.24 | 1.96 | 2.88 |
| 1966 | 91 | 328 | 419 | 7.10 | 1.96 | 3.08 |
| 1967 | 65 | 300 | 365 | NA | NA | NA |
| 1968 | 189 | 330 | 519 | 3.12 | 1.89 | 2.33 |
| 1969 | 722 | 308 | 1,030 | 2.18 | 2.03 | 2.13 |
| 1970 | 3,124 | 323 | 3,447 | 1.83 | 2.13 | 1.86 |
| 1971 | 6,737 | 327 | 7,064 | 1.79 | 2.27 | 1.82 |
| 1972 | 7,899 | 322 | 8,221 | 2.01 | 2.45 | 2.02 |
| 1973 | 10,411 | 314 | 10,725 | 2.83 | 2.60 | 2.82 |
| 1974 | 13,775 | 331 | 14,106 | 3.91 | 3.00 | 3.90 |
| 1975 | 21,620 | 520 | 22,140 | 5.06 | 5.04 | 5.06 |
| 1976 | 25,919 | 312 | 26,231 | NA | NA | 4.90 |
| 1977 | 29,020 | 300 | 29,320 | NA | NA | 5.30 |

Source: United States Department of Energy, Energy Information Administration.

## TABLE 3.5
## SUMMARY OF RECEIPTS OF MONTANA AND WYOMING COAL BY ELECTRIC UTILITY PLANTS
## (1000 short tons)

| | MONTANA COAL | | | WYOMING COAL | | |
|---|---|---|---|---|---|---|
| Year | Received by In-State Utility Plants | Received by Out-of-State Utility Plants | Total | Received by In-State Utility Plants | Received by Out-of-State Utility Plants | Total |
| 1972[1] | 336 | 4,386 | 4,722 | 2,874 | 2,676 | 5,550 |
| 1973 | 882 | 9,741 | 10,623 | 5,670 | 7,453 | 13,123 |
| 1974 | 822 | 13,114 | 13,936 | 5,792 | 12,087 | 17,879 |
| 1975 | 1,197 | 20,180 | 21,377 | 7,235 | 14,356 | 21,591 |
| 1976 | 2,316 | 22,642 | 24,958 | 7,711 | 18,070 | 25,781 |
| 1977[2] | 1,409 | 10,626 | 12,035 | 4,377 | 13,606 | 17,983 |

Source: Federal Power Commission Form 423.
[1]For six months from July 1, 1972, to December 31, 1972.
[2]For six months from January 1, 1977, to June 30, 1977.

## TABLE 3.6
## AVERAGE MINE-MOUTH COAL PRICES IN MONTANA, BY COUNTY
## ($/ton)

| Year | Big Horn | Carbon | Cascade | Custer | Dawson | Fallon | Garfield | McCone |
|---|---|---|---|---|---|---|---|---|
| 1950 | | 4.77 | 6.47 | 3.23 | 3.00 | | 3.00 | 2.04 |
| 1951 | | 5.00 | 1.43 | 3.00 | 2.48 | 2.00 | 2.00 | |
| 1952 | | 5.04 | 9.59 | 3.95 | 2.00 | | 2.00 | |
| 1953 | | 5.47 | 10.90 | 4.00 | 2.00 | | | |
| 1954 | | 7.48 | 6.80 | 4.13 | 3.00 | | | 3.00 |
| 1955 | | 3.50 | 8.06 | 1.00 | 1.00 | | | |
| 1956 | | 7.25 | 6.90 | | 1.10 | | | 1.12 |
| 1957 | | 7.50 | 7.30 | | 1.00 | | | 1.00 |
| 1958 | | 7.56 | 7.75 | | 1.00 | | | 1.00 |
| 1959 | | 7.53 | 7.55 | | 1.00 | | | 1.00 |
| 1960 | | 7.45 | 7.67 | | 1.00 | | | 1.00 |
| 1961 | | 7.66 | 7.82 | | 1.00 | | | 2.16 |
| 1962 | | 7.69 | 7.79 | | 1.00 | | | 3.59 |
| 1963 | | 8.08 | 7.74 | | 1.00 | | | 1.88 |
| 1964 | | 8.26 | | | 1.00 | | | 1.75 |
| 1965 | | 6.76 | | | 1.00 | | | 4.00 |
| 1966 | | 6.49 | | | 1.00 | | | 3.08 |
| 1967 | | | | | 1.00 | | | 3.51 |
| 1968 | | | | | 1.00 | | | 4.96 |
| 1969 | | | | | 1.00 | | | 1.00 |
| 1970 | 4.62 | | | | 1.00 | | | 3.57 |
| 1971 | | | | | 1.00 | | | |
| 1972 | 3.47 | | | | 1.00 | | | |
| 1973 | 3.93 | | | | 1.00 | | | |
| 1974 | 4.53 | | | | 1.00 | | | |
| 1975 | 5.68 | | | | | | | |
| 1976 | 6.69 | | | | | | | |
| 1977 | 6.89 | | | | | | | |

## TABLE 3.6 (continued)
## AVERAGE MINE-MOUTH COAL PRICES IN MONTANA, BY COUNTY
## ($/ton)

| Year | Musselshell | Powder River | Prairie | Richland | Rosebud | Sheridan | Valley | State Average |
|---|---|---|---|---|---|---|---|---|
| 1950 | 4.50 | 2.00 | 2.00 | 3.52 | 1.32 | 3.00 | 3.00 | 2.34 |
| 1951 | 4.14 | 2.00 | 2.00 | 3.39 | 1.65 | | 3.50 | 2.54 |
| 1952 | 4.35 | 2.00 | 2.00 | 2.49 | 1.98 | 3.30 | 3.50 | 2.76 |
| 1953 | 4.75 | 3.00 | 3.00 | 3.80 | 2.00 | | | 2.66 |
| 1954 | 4.25 | 3.00 | 3.00 | 4.09 | 2.00 | 3.50 | | 2.62 |
| 1955 | 4.60 | | | 3.00 | 2.00 | 3.55 | | 2.83 |
| 1956 | 4.95 | 1.10 | 1.10 | 4.30 | 1.95 | 3.56 | | 2.83 |
| 1957 | 5.38 | 1.00 | 1.00 | 4.33 | 2.95 | 3.58 | | 4.35 |
| 1958 | 4.03 | 1.00 | 1.00 | 1.96 | 2.83 | 5.57 | | 3.55 |
| 1959 | 5.44 | 1.00 | 1.00 | 1.93 | | 3.80 | | 3.59 |
| 1960 | 6.40 | 1.00 | | 1.94 | | 3.80 | | 3.56 |
| 1961 | 6.32 | 1.00 | | 1.93 | | 3.93 | | 3.04 |
| 1962 | 4.24 | 1.00 | | 1.92 | | 4.00 | | 2.45 |
| 1963 | 6.29 | 1.00 | | 1.92 | | 4.00 | | 2.57 |
| 1964 | 6.58 | 1.00 | | 1.92 | | 4.00 | | 2.58 |
| 1965 | 6.47 | 1.00 | | 1.93 | | 4.32 | | 2.83 |
| 1966 | 6.98 | 1.00 | | 1.94 | | 4.31 | | 2.91 |
| 1967 | 7.07 | 1.00 | | 1.95 | | 4.50 | | 2.42 |
| 1968 | 7.58 | 1.00 | | 1.95 | 1.63 | 4.50 | | 2.15 |
| 1969 | 8.08 | 1.00 | | 2.02 | 1.81 | | | 2.07 |
| 1970 | 6.73 | 1.00 | | 2.12 | 1.68 | | | 1.82 |
| 1971 | 4.29 | 1.00 | | 2.25 | 1.73 | | | 1.79 |
| 1972 | 5.41 | 6.00 | | 2.43 | 1.83 | | | 2.03 |
| 1973 | 9.31 | 7.13 | | 2.58 | 2.06 | | | 2.83 |
| 1974 | 6.62 | 9.41 | | 3.39 | 2.80 | | | 3.84 |
| 1975 | 10.00 | 10.00 | | 5.02 | 3.85 | | | 4.97 |
| 1976 | 18.31 | 9.74 | | 6.35 | 4.49 | | | 5.72 |
| 1977 | 20.84 | 7.86 | | 6.92 | 4.48 | | | 5.83 |

Source: Montana Department of Revenue, Property Assessment Division.

## TABLE 3.7
## DISTRIBUTION OF COAL PRODUCED IN MONTANA, WYOMING, AND NORTH DAKOTA IN 1976 AND 1977, BY STATE OF DESTINATION
## (1000 short tons)

| STATE OF DESTINATION | STATE OF ORIGIN | | | | | | TOTAL | |
|---|---|---|---|---|---|---|---|---|
| | Montana | | Wyoming | | North and South Dakota | | | |
| | 1976 | 1977 | 1976 | 1977 | 1976 | 1977 | 1976 | 1977 |
| Ohio | — | — | 2,170 | 4,046 | — | — | 2,170 | 4,046 |
| Kentucky | 42 | — | — | 41 | — | — | 42 | 41 |
| Tennessee | — | — | — | 41 | — | — | — | 41 |
| Alabama | — | — | — | 43 | — | — | — | 43 |
| Illinois | 8,759 | 6,166 | 1,728 | 3,466 | — | — | 10,487 | 9,632 |
| Indiana | 1,243 | 2,315 | 2,528 | 2,574 | 7 | — | 3,778 | 4,889 |
| Michigan | 2,887 | 3,486 | — | — | — | — | 2,887 | 3,486 |
| Minnesota | 8,115 | 10,036 | 29 | 17 | 1,161 | 1,350 | 9,305 | 11,403 |
| Wisconsin | 2,584 | 2,722 | 985 | 710 | — | — | 3,569 | 3,432 |
| Iowa | 329 | 232 | 3,227 | 4,154 | 13 | — | 3,569 | 4,386 |
| Kansas | — | — | 1,150 | 3,312 | — | — | 1,150 | 3,312 |
| Missouri | — | — | 1,062 | 939 | — | — | 1,062 | 939 |
| Nebraska | — | — | 2,044 | 2,055 | — | — | 2,044 | 2,055 |
| Oklahoma | — | — | 599 | 1,920 | — | — | 599 | 1,920 |
| Texas | — | — | 1,411 | 4,587 | — | — | 1,411 | 4,587 |
| Idaho | — | — | 448 | 343 | — | — | 448 | 343 |
| **Montana** | **2,452** | **3,227** | **73** | **150** | **—** | **—** | **2,525** | **3,377** |
| North Dakota | 1 | — | 6 | 4 | 7,488 | 8,207 | 7,495 | 8,211 |
| South Dakota | 3 | 14 | 410 | 482 | 2,422 | 2,244 | 2,835 | 2,740 |
| Wyoming | — | — | 9,780 | 13,291 | — | — | 9,780 | 13,291 |
| Colorado | — | — | 3,099 | 2,431 | — | — | 3,099 | 2,431 |
| Utah | — | — | 29 | 78 | — | — | 29 | 78 |
| California | — | — | 1 | — | — | — | 1 | — |
| Oregon | — | — | 244 | 255 | — | — | 244 | 255 |
| Nevada | — | — | — | 1 | — | — | — | 1 |
| Washington | — | — | 138 | 224 | — | — | 138 | 224 |
| **TOTAL ALL STATES** | **26,415** | **28,198** | **31,141** | **45,134** | **11,091** | **11,801** | **68,647** | **85,133** |
| **% OF TOTAL** | **38.5** | **33.1** | **45.4** | **53.0** | **16.1** | **13.9** | **100.0** | **100.0** |

Sources: U.S. Bureau of Mines, "Bituminous Coal and Lignite Distribution Calendar Year 1976," *Mineral Industry Surveys*, pages 12-41; U.S. Department of Energy, Energy Information Administration, "Bituminous Coal and Lignite Distribution January - September 1977," pages 13-43; and "Bituminous Coal and Lignite Distribution October-December 1977," pages 17-49.

## TABLE 3.8
## DISTRIBUTION OF COAL IN MONTANA
## (1000 short tons)

| | Electric Utility | Retail Dealers | Other Usage | Total |
|---|---|---|---|---|
| 1974 | 843 | 9 | 55 | 907 |
| 1975 | 1,203 | 7 | 42 | 1,252 |
| 1976 | 2,452 | 5 | 108 | 2,565 |
| 1977 | 3,225 | 1 | 182 | 3,408 |

Source: U.S. Bureau of Mines, "Bituminous Coal and Lignite Distribution Calendar Year 1976," *Mineral Industry Surveys*, page 50; U.S. Department of Energy, Energy Information Administration, *Energy Data Reports*, "Bituminous Coal and Lignite Distribution — January-September 1977," page 40, and "Bituminous Coal and Lignite Distribution October-December 1977," page 45.

# 4

# NATURAL GAS

## HIGHLIGHTS

- Proved reserves of natural gas as of December 31, 1977, amounted to 1.094 trillion cubic feet, down 1 percent from a year earlier.
- Montana wells produced 48.2 billion cubic feet of natural gas in 1977, an increase of 7 percent from the previous year.
- In 1977, 64.5 billion cubic feet of natural gas were sold, down 8 percent from 1976.
- Residential gas customers paid an average of $1.816 per MCF in 1977, commercial customers paid an average of $1.584 per MCF, and industrial customers paid an average of $1.558 per MCF.

## TABLES


| Table | | Page |
|---|---|---|
| 4.1 | Natural Gas Proved Reserves in Montana December 31, 1950-77 | 36 |
| 4.2 | Production and Average Wellhead Prices of Natural Gas in Montana | 37 |
| 4.3 | Sales and Average Prices of Natural Gas in Montana | 38 |
| 4.4 | Sales of Natural Gas in Montana by Gas Utilities | 40 |
| 4.5 | Average Annual Natural Gas Prices in Montana | 43 |
| 4.6 | Natural Gas Production and Consumption in Montana | 45 |
| 4.7 | Capacity and Production of Natural Gas Processing Plants in Montana | 46 |
| 4.8 | Consumption of Natural Gas by Mining and Manufacturing in Montana in 1977 | 46 |


## FIGURES


| Figure | | Page |
|---|---|---|
| 4.1 | Supply of Natural Gas in Montana, 1977 | 39 |
| 4.2 | Sales of Natural Gas in Montana, by Consuming Sector | 39 |
| 4.3 | Supply of Natural Gas in Montana, by Source Region, 1954-77 | 42 |
| 4.4 | Montana Natural Gas Production and Exports, 1965-77 | 44 |


Note: All volumetric data presented in Chapter 4 are expressed using a pressure base of 14.73 pounds per square inch absolute (psia) at 60 degrees Farenheit (60°F). Conversions to this uniform pressure base were made by MEO, where necessary.

## TABLE 4.1
## NATURAL GAS PROVED RESERVES IN MONTANA DECEMBER 31, 1950-77
## (million cubic feet)

| | Nonassociated | Associated/ Dissolved | Underground Storage | Total Gas |
|---|---|---|---|---|
| 1950 | 718,722 | 69,839 | 4,470 | 793,031 |
| 1951 | 696,554 | 119,533 | 7,522 | 823,609 |
| 1952 | 693,916 | 119,631 | 9,562 | 823,109 |
| 1953 | 612,965 | 117,937 | 28,949 | 759,851 |
| 1954 | 573,496 | 116,183 | 30,122 | 719,801 |
| 1955 | 560,565 | 125,067 | 30,178 | 715,810 |
| 1956 | 546,049 | 115,906 | 30,614 | 692,569 |
| 1957 | 512,583 | 119,311 | 34,914 | 666,808 |
| 1958 | 508,851 | 132,295 | 37,163 | 678,309 |
| 1959 | 492,162 | 128,880 | 40,835 | 661,877 |
| 1960 | 462,532 | 105,362 | 54,883 | 622,777 |
| 1961 | 435,178 | 104,319 | 53,601 | 593,098 |
| 1962 | 419,128 | 98,958 | 82,085 | 600,171 |
| 1963 | 399,266 | 103,558 | 95,307 | 598,131 |
| 1964 | 384,278 | 99,287 | 106,704 | 590,269 |
| 1965 | 373,440 | 103,672 | 118,740 | 595,852 |
| 1966 | 383,346 | 102,239 | 134,765 | 620,350 |
| 1967 | 550,681 | 138,454 | 148,583 | 837,718 |
| 1968 | 579,572 | 174,266 | 157,695 | 911,533 |
| 1969 | 799,770 | 147,927 | 162,511 | 1,110,208 |
| 1970 | 793,283 | 141,854 | 164,786 | 1,099,923 |
| 1971 | 715,195 | 127,032 | 182,334 | 1,024,561 |
| 1972 | 790,660 | 92,628 | 180,748 | 1,064,036 |
| 1973 | 821,513 | 85,625 | 185,311 | 1,092,449 |
| 1974 | 676,749 | 81,272 | 143,239 | 901,260 |
| 1975 | 686,350 | 73,912 | 169,724 | 929,986 |
| 1976 | 876,452 | 67,435 | 162,383 | 1,106,270 |
| 1977 | 815,862 | 67,428 | 160,692 | 1,093,982 |

Source: American Gas Association, *Gas Facts* annual report. Arlington, Virginia.
Note: See Note 4.1 in Appendix.

## TABLE 4.2
## PRODUCTION AND AVERAGE WELLHEAD PRICES OF NATURAL GAS IN MONTANA

| | Production[1] (MMCF) | Production[2] (MMCF) | Average Wellhead[2] Price (cents/MCF) |
|---|---|---|---|
| 1950 | 39708 | 39010 | 5.0 |
| 1951 | 39038 | 36123 | 5.3 |
| 1952 | 30409 | 27939 | 5.7 |
| 1953 | 31779 | 28592 | 6.3 |
| 1954 | 31150 | 29765 | 6.0 |
| 1955 | 30468 | 30227 | 5.2 |
| 1956 | 29356 | 28350 | 6.1 |
| 1957 | 32979 | 31413 | 6.0 |
| 1958 | 31327 | 27689 | 6.5 |
| 1959 | 31585 | 30551 | 6.0 |
| 1960 | 35381 | 30411 | 6.8 |
| 1961 | 34884 | 32407 | 6.4 |
| 1962 | 28973 | 29417 | 6.1 |
| 1963 | 27113 | 25504 | 6.6 |
| 1964 | 25234 | 23592 | 6.6 |
| 1965 | 27873 | 26285 | 6.5 |
| 1966 | 32414 | 29041 | 8.1 |
| 1967 | 31619 | 29276 | 7.9 |
| 1968 | 31917 | 28831 | 8.8 |
| 1969 | 41229 | 37804 | 7.2 |
| 1970 | 37445 | 35225 | 8.1 |
| 1971 | 38137 | 28775 | 8.2 |
| 1972 | 35606 | 32171 | 10.0 |
| 1973 | 58896 | 56383 | 15.9 |
| 1974 | 51401 | 41753 | 25.2 |
| 1975 | 44546 | 41664 | 39.4 |
| 1976 | 45098 | 42449 | 44.0 |
| 1977 | 48181 | 45245 | 72.0 |

[1]Source: Montana Oil and Gas Conservation Division.
[2]Source: Montana Department of Revenue.
Note: See Note 4.2 in Appendix.

## TABLE 4.3
## SALES AND AVERAGE PRICES OF NATURAL GAS IN MONTANA

| | SALES (trillion Btu) | | | | | AVERAGE PRICE (cents/million Btu) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Residential | Commercial | Industrial | Other | Total | Residential | Commercial | Industrial | Other | Total |
| 1950 | 12.3 | 5.9 | 12.9 | 1.7 | 32.7 | 36.9 | 27.0 | 30.3 | 5.9 | 31.0 |
| 1951 | 12.5 | 6.7 | 15.0 | 1.7 | 35.9 | 49.7 | 35.8 | 17.2 | 22.9 | 32.3 |
| 1952 | 12.3 | 7.1 | 15.4 | 2.9 | 37.7 | 51.6 | 37.0 | 21.4 | 20.5 | 34.1 |
| 1953 | 12.1 | 7.0 | 15.5 | 1.7 | 36.3 | 52.7 | 37.8 | 21.6 | 23.9 | 35.2 |
| 1954 | 13.4 | 7.7 | 14.1 | 1.7 | 36.9 | 52.6 | 38.7 | 22.3 | 24.2 | 36.8 |
| 1955 | 15.4 | 8.7 | 17.6 | 1.8 | 43.5 | 52.0 | 38.3 | 22.4 | 24.1 | 36.1 |
| 1956 | 15.8 | 9.0 | 18.8 | 1.8 | 45.4 | 51.0 | 37.7 | 21.8 | 24.2 | 35.1 |
| 1957 | 17.0 | 9.6 | 18.4 | 1.9 | 46.9 | 57.4 | 41.8 | 25.0 | 24.9 | 40.2 |
| 1958 | 16.3 | 9.1 | 19.3 | 1.9 | 46.6 | 59.1 | 43.1 | 27.0 | 27.0 | 41.4 |
| 1959 | 18.9 | 10.8 | 16.6 | 2.2 | 48.5 | 58.9 | 43.5 | 27.6 | 27.6 | 43.3 |
| 1960 | 18.5 | 11.0 | 19.8 | 2.0 | 51.3 | 60.1 | 45.2 | 27.6 | 29.2 | 43.2 |
| 1961 | 18.7 | 11.5 | 20.8 | 2.1 | 53.1 | 59.8 | 44.5 | 27.9 | 26.9 | 42.7 |
| 1962 | 19.4 | 12.0 | 21.9 | 2.2 | 55.5 | 65.7 | 47.1 | 29.8 | 30.1 | 46.1 |
| 1963 | 19.0 | 11.7 | 24.4 | 2.2 | 57.3 | 68.9 | 49.6 | 31.6 | 33.0 | 47.6 |
| 1964 | 21.1 | 13.2 | 26.6 | 2.4 | 63.3 | 68.2 | 49.2 | 31.6 | 32.8 | 47.5 |
| 1965 | 22.6 | 14.4 | 28.0 | 2.5 | 67.4 | 68.1 | 49.3 | 31.1 | 32.1 | 47.4 |
| 1966 | 22.0 | 14.2 | 28.2 | 2.5 | 66.9 | 69.4 | 50.2 | 31.6 | 33.1 | 48.0 |
| 1967 | 21.9 | 14.7 | 25.3 | 2.6 | 64.4 | 71.7 | 51.9 | 34.0 | 33.1 | 50.9 |
| 1968 | 22.4 | 14.6 | 26.6 | 2.7 | 66.2 | 75.4 | 55.7 | 33.0 | 32.9 | 52.3 |
| 1969 | 23.7 | 15.5 | 32.2 | 2.7 | 74.1 | 79.9 | 59.0 | 33.4 | 35.3 | 53.7 |
| 1970 | 23.5 | 15.4 | 36.4 | 3.5 | 78.8 | 84.2 | 62.1 | 33.6 | 36.1 | 54.4 |
| 1971 | 24.4 | 15.9 | 35.6 | 3.0 | 79.0 | 84.6 | 62.7 | 33.4 | 37.7 | 55.3 |
| 1972 | 25.9 | 16.9 | 36.7 | 3.3 | 82.8 | 87.1 | 64.5 | 34.4 | 39.4 | 57.2 |
| 1973 | 24.7 | 16.3 | 36.5 | 4.2 | 81.7 | 97.5 | 73.0 | 41.3 | 45.2 | 64.7 |
| 1974 | 23.8 | 15.7 | 36.1 | 3.1 | 78.7 | 102.0 | 88.0 | 57.0 | 58.0 | 76.0 |
| 1975 | 26.3 | 17.6 | 32.6 | 3.3 | 79.8 | 118.0 | 102.0 | 92.0 | 88.0 | 103.0 |
| 1976 | 23.9 | 16.0 | 28.3 | 2.9 | 71.0 | 150.0 | 130.0 | 124.0 | 123.0 | 134.0 |
| 1977 | 23.2 | 15.6 | 24.3 | 2.6 | 65.8 | 169.0 | 148.0 | 153.0 | 147.0 | 157.0 |

Source: American Gas Assocation, *Gas Facts* annual report. Arlington, Virginia.
Note: See Note 4.3 in Appendix.

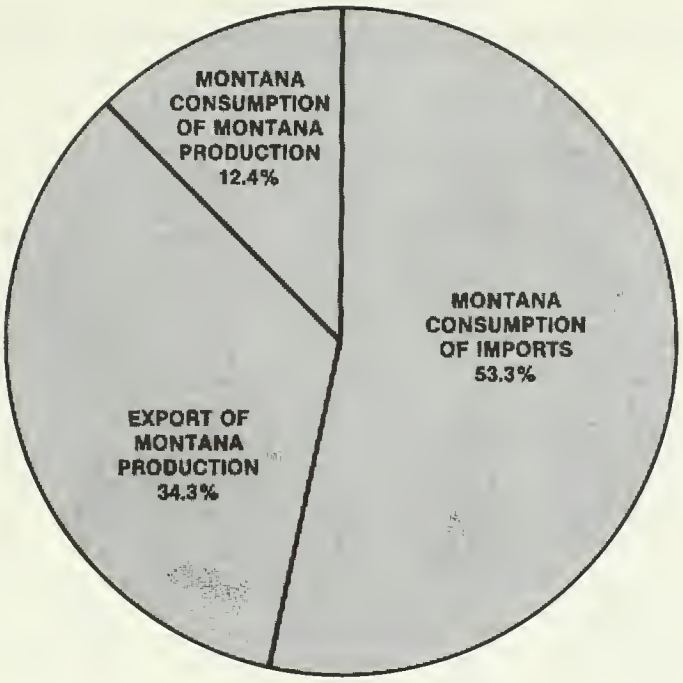



**FIGURE 4.1 SUPPLY OF NATURAL GAS IN MONTANA, 1977**

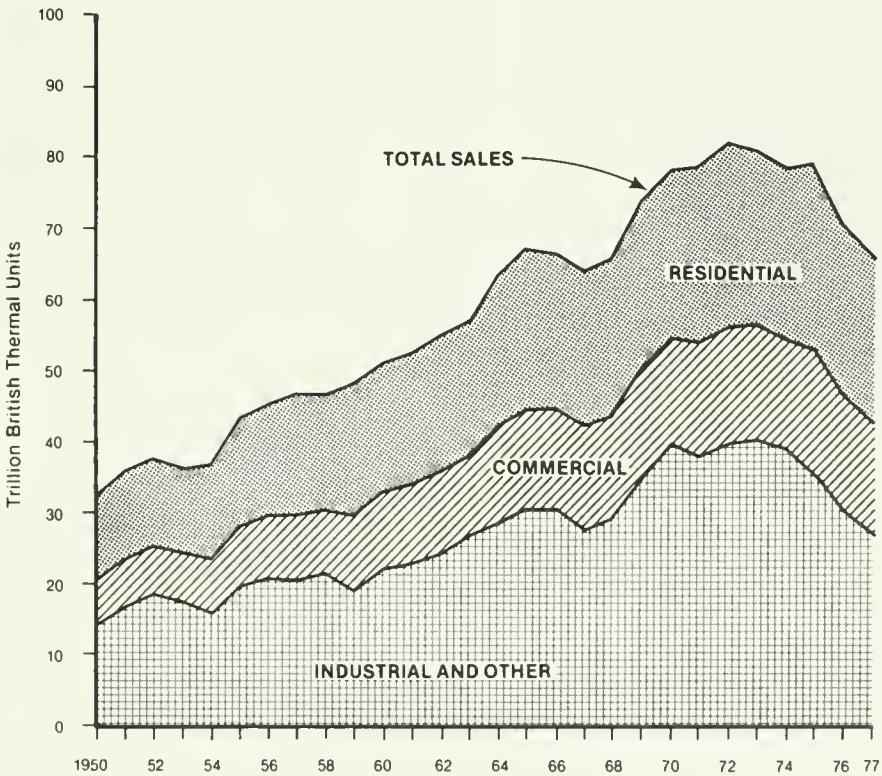



**FIGURE 4.2 SALES OF NATURAL GAS IN MONTANA, BY CONSUMING SECTOR**

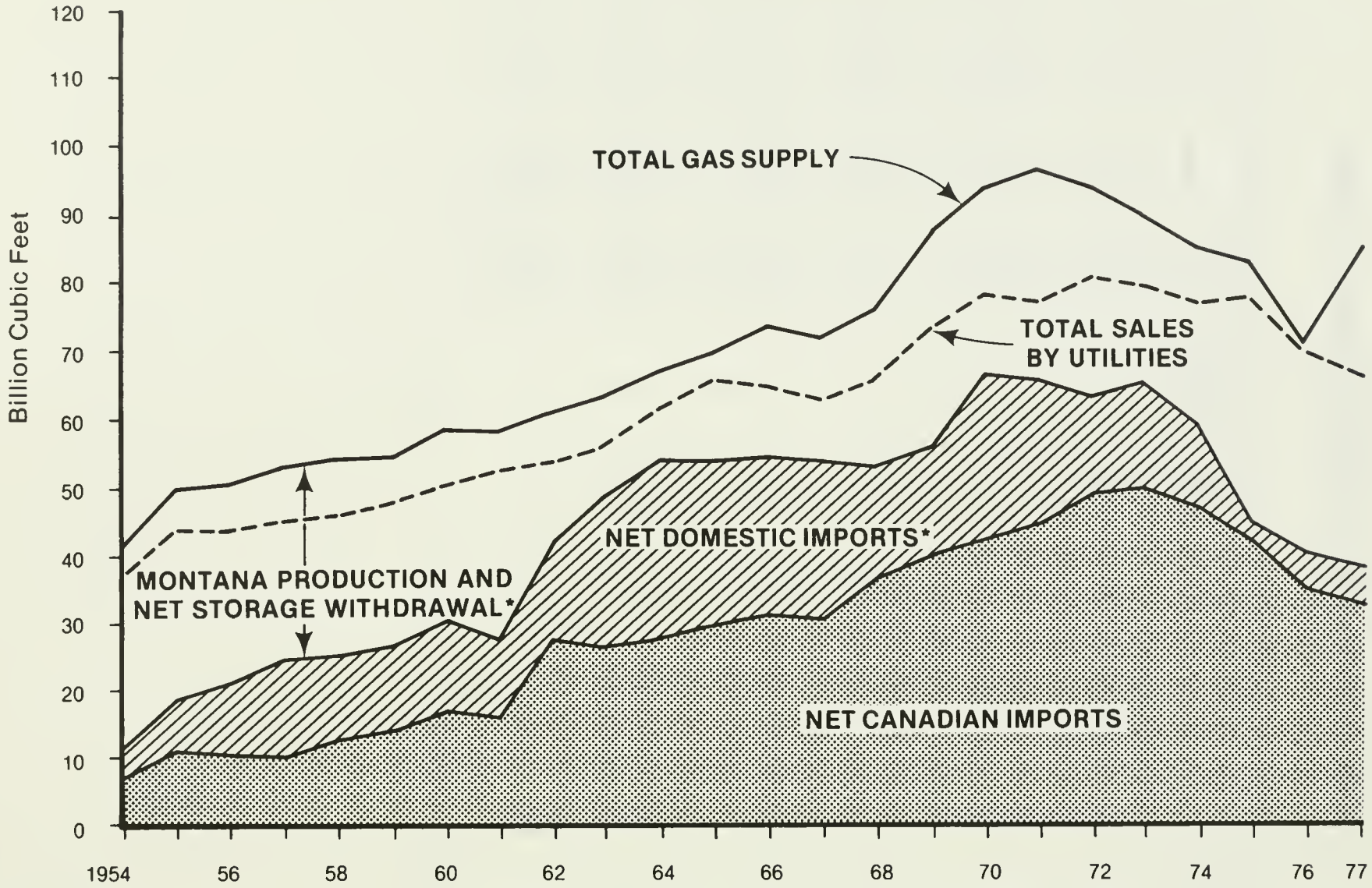
# TABLE 4.4
# SALES OF NATURAL GAS IN MONTANA BY GAS UTILITIES (MMCF)

| | MONTANA POWER COMPANY | | | | | | MONTANA-DAKOTA UTILITIES | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Residential and Commercial | Industrial | Other | Total | % of Total Montana Sales | Sales to Canada | Residential and Commercial | Industrial | Other | Total | % of Total Montana Sales |
| 1950 | 8,648 | 8,942 | 705 | 18,295 | 56 | 0 | 4,228 | 240 | 469 | 4,937 | 15 |
| 1951 | 8,848 | 13,055 | 720 | 22,623 | 61 | 0 | 5,514 | 1,180 | 499 | 7,193 | 19 |
| 1952 | NA | NA | NA | NA | NA | NA | 7,340 | 1,845 | 468 | 9,653 | NA |
| 1953 | 8,848 | 13,700 | 719 | 23,267 | 63 | 0 | 7,223 | 1,863 | 480 | 9,566 | 26 |
| 1954 | 9,406 | 12,323 | 746 | 22,475 | 61 | 0 | 7,912 | 1,649 | 495 | 10,056 | 27 |
| 1955 | 12,204 | 15,621 | 826 | 28,651 | 65 | 0 | 7,594 | 1,996 | 533 | 10,123 | 23 |
| 1956 | 12,076 | 15,720 | 788 | 28,584 | 65 | 0 | 7,708 | 2,212 | 509 | 10,429 | 24 |
| 1957 | 13,661 | 15,677 | 834 | 30,172 | 66 | 0 | 7,797 | 2,056 | 492 | 10,345 | 23 |
| 1958 | 13,445 | 15,334 | 836 | 29,615 | 64 | 0 | 7,429 | 3,233 | 551 | 11,213 | 24 |
| 1959 | 15,576 | 12,802 | 1,025 | 29,403 | 62 | 0 | 8,678 | 2,934 | 507 | 12,119 | 25 |
| 1960 | 15,604 | 15,641 | 1,150 | 32,395 | 64 | 0 | 8,516 | 3,148 | 342 | 12,006 | 24 |
| 1961 | 15,567 | 16,824 | 1,165 | 33,556 | 64 | 0 | 8,689 | 3,606 | 117 | 12,472 | 24 |
| 1962 | 16,233 | 18,265 | 1,211 | 35,709 | 66 | 0 | 9,148 | 3,051 | 103 | 12,302 | 23 |
| 1963 | 15,901 | 19,831 | 1,265 | 36,997 | 66 | 0 | 8,826 | 3,862 | 79 | 12,767 | 23 |
| 1964 | 18,031 | 21,131 | 1,396 | 40,558 | 66 | 0 | 9,620 | 4,687 | 55 | 14,362 | 23 |
| 1965 | 19,255 | 22,382 | 1,452 | 43,089 | 65 | 0 | 10,955 | 4,430 | 61 | 15,446 | 23 |
| 1966 | 18,954 | 23,256 | 1,456 | 43,666 | 67 | 90 | 10,414 | 4,256 | 55 | 14,725 | 22 |
| 1967 | 19,255 | 20,977 | 1,528 | 41,760 | 66 | 106 | 10,584 | 3,813 | 67 | 14,464 | 23 |
| 1968 | 20,327 | 21,871 | 1,645 | 43,843 | 66 | 104 | 10,847 | 4,523 | 65 | 15,435 | 23 |
| 1969 | 21,177 | 25,758 | 1,669 | 48,604 | 66 | 112 | 11,534 | 6,277 | 55 | 17,866 | 24 |
| 1970 | 21,897 | 27,709 | 1,591 | 51,197 | 65 | 109 | 11,499 | 8,582 | 102 | 20,183 | 26 |
| 1971 | 22,060 | 26,339 | 1,637 | 50,036 | 65 | 113 | 11,612 | 8,317 | 139 | 20,068 | 26 |
| 1972 | 23,142 | 27,525 | 1,682 | 52,349 | 65 | 126 | 12,352 | 8,218 | 600 | 21,170 | 26 |
| 1973 | 22,896 | 26,791 | 1,686 | 51,373 | 64 | 88 | 11,525 | 8,685 | 1,415 | 21,623 | 27 |
| 1974 | 21,831 | 26,492 | 1,589 | 49,912 | 65 | 31 | 11,230 | 8,455 | 588 | 20,273 | 26 |
| 1975 | 23,942 | 24,484 | 1,717 | 50,143 | 64 | 66 | 12,785 | 7,244 | 586 | 20,615 | 26 |
| 1976 | 21,666 | 21,043 | 1,593 | 44,302 | 63 | 38 | 12,208 | 6,782 | 318 | 19,308 | 27 |
| 1977 | 20,959 | 18,147 | 1,494 | 40,600 | 63 | 31 | 11,975 | 5,666 | 218 | 17,859 | 28 |
| 1978 | 26,281 | 17,102 | 1,534 | 39,917 | NA | 66 | 13,730 | 3,856 | 261 | 17,847 | NA |

# TABLE 4.4 (continued)
# SALES OF NATURAL GAS IN MONTANA BY GAS UTILITIES (MMCF)

| | GREAT FALLS GAS COMPANY | | | | | OTHER UTILITIES | | TOTAL SALES | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Residential and Commercial | Industrial | Other | Total | % of Total Montana Sales | Total for all Sectors | % of Total Montana Sales | Residential and Commercial | Industrial | Other | Total |
| 1950 | 2,509 | 208 | 53 | 2,770 | 9 | 6,481 | 20 | 21,866 | 9,390 | 1,227 | 32,483 |
| 1951 | 2,697 | 311 | 191 | 3,199 | 9 | 4,055 | 11 | 21,114 | 14,546 | 1,410 | 37,070 |
| 1952 | 2,566 | 228 | 333 | 3,127 | NA | 852 | NA | NA | NA | NA | NA |
| 1953 | 2,478 | 238 | 350 | 3,066 | 8 | 814 | 2 | 19,363 | 15,801 | 1,549 | 36,713 |
| 1954 | 2,795 | 255 | 400 | 3,450 | 9 | 892 | 2 | 21,005 | 14,227 | 1,641 | 36,873 |
| 1955 | 3,284 | 243 | 434 | 3,961 | 9 | 1,049 | 2 | 24,131 | 17,860 | 1,793 | 43,784 |
| 1956 | 3,361 | 204 | 396 | 3,961 | 9 | 1,019 | 2 | 24,164 | 18,136 | 1,693 | 44,090 |
| 1957 | 3,510 | 258 | 451 | 4,219 | 9 | 955 | 2 | 25,923 | 17,991 | 1,777 | 45,691 |
| 1958 | 3,365 | 268 | 475 | 4,108 | 9 | 1,067 | 2 | 25,306 | 18,835 | 1,862 | 46,003 |
| 1959 | 4,048 | 388 | 566 | 5,002 | 10 | 1,175 | 2 | 29,477 | 16,124 | 2,098 | 47,699 |
| 1960 | 3,928 | 512 | 516 | 4,956 | 10 | 1,152 | 2 | 29,200 | 19,301 | 2,008 | 50,509 |
| 1961 | 4,067 | 380 | 606 | 5,053 | 10 | 1,045 | 2 | 29,368 | 20,810 | 1,948 | 52,126 |
| 1962 | 4,092 | 371 | 752 | 5,215 | 10 | 1,078 | 2 | 30,551 | 21,687 | 2,066 | 54,304 |
| 1963 | 4,030 | 396 | 793 | 5,219 | 9 | 945 | 2 | 29,702 | 24,089 | 2,137 | 55,928 |
| 1964 | 4,446 | 480 | 847 | 5,773 | 9 | 1,018 | 2 | 33,115 | 26,298 | 2,298 | 61,711 |
| 1965 | 4,767 | 499 | 868 | 6,134 | 9 | 1,160 | 2 | 36,137 | 27,311 | 2,381 | 65,829 |
| 1966 | 4,593 | 490 | 846 | 5,929 | 9 | 1,125 | 2 | 35,086 | 28,002 | 2,357 | 65,445 |
| 1967 | 4,505 | 397 | 856 | 5,758 | 9 | 1,160 | 2 | 35,504 | 25,187 | 2,451 | 63,142 |
| 1968 | 4,504 | 424 | 852 | 5,780 | 9 | 1,074 | 2 | 36,752 | 26,818 | 2,562 | 66,132 |
| 1969 | 5,042 | 412 | 891 | 6,345 | 9 | 1,118 | 1 | 38,871 | 32,447 | 2,615 | 73,933 |
| 1970 | 4,926 | 378 | 902 | 6,206 | 8 | 1,010 | 1 | 39,332 | 36,669 | 2,595 | 78,596 |
| 1971 | 4,901 | 367 | 895 | 6,163 | 8 | 1,048 | 1 | 39,621 | 35,023 | 2,671 | 77,315 |
| 1972 | 5,185 | 353 | 884 | 6,422 | 8 | 1,105 | 1 | 41,784 | 36,096 | 3,166 | 81,046 |
| 1973 | 4,729 | 414 | 864 | 6,007 | 8 | 982 | 1 | 40,132 | 35,890 | 3,965 | 79,987 |
| 1974 | 4,504 | 412 | 807 | 5,723 | 7 | 936 | 1 | 38,501 | 35,359 | 2,984 | 76,844 |
| 1975 | 5,145 | 354 | 845 | 6,344 | 8 | 1,000 | 1 | 42,872 | 32,082 | 3,148 | 78,102 |
| 1976 | 4,875 | 237 | 892 | 6,004 | 9 | 762 | 1 | 39,511 | 28,062 | 2,803 | 70,376 |
| 1977 | 4,317 | 246 | 734 | 5,297 | 8 | 715 | 1 | 37,966 | 24,059 | 2,446 | 64,471 |
| 1978 | 4,818 | 196 | 826 | 5,840 | NA | NA | NA | NA | 21,154 | 2,621 | NA |

Note: Excludes all sales for resale. See Note 4.4 in Appendix.
Source: Annual Reports by Gas Utilities to the Montana Public Service Commission.




*excludes exports by Northern Natural Gas Co. from Montana's Tiger Ridge area.

**FIGURE 4.3 SUPPLY OF NATURAL GAS IN MONTANA, BY SOURCE REGION, 1954-77**

## TABLE 4.5
## AVERAGE ANNUAL NATURAL GAS PRICES IN MONTANA (cents/MCF)

| | | | DELIVERED | | | |
|---|---|---|---|---|---|---|
| | Wellhead | Retail | Residential | Commercial | Industrial | Average[1] |
| 1950 | 5.3 | 28.7 | 47.3 | 32.8 | 14.2 | 30.1 |
| 1951 | 5.5 | 31.3 | 51.0 | 35.1 | 16.0 | 32.0 |
| 1952 | 6.1 | 31.8 | 50.7 | 35.2 | 19.2 | 32.4 |
| 1953 | 5.9 | 32.9 | 53.1 | 36.8 | 19.4 | 33.7 |
| 1954 | 6.8 | 37.5 | 58.9 | 41.5 | 20.1 | 38.8 |
| 1955 | 6.7 | 36.7 | 58.3 | 41.1 | 20.2 | 38.0 |
| 1956 | 6.8 | 36.8 | 58.5 | 41.2 | 20.6 | 38.2 |
| 1957 | 7.2 | 36.9 | 58.3 | 41.3 | 20.8 | 38.0 |
| 1958 | 6.8 | 38.4 | 64.7 | 44.3 | 21.8 | 40.1 |
| 1959 | 7.5 | 41.6 | 64.7 | 45.7 | 26.7 | 45.6 |
| 1960 | 7.1 | 41.6 | 66.0 | 46.4 | 27.4 | 45.4 |
| 1961 | 7.4 | 40.3 | 65.5 | 45.9 | 25.7 | 43.8 |
| 1962 | 7.4 | 41.9 | 75.2 | 50.6 | 25.1 | 46.4 |
| 1963 | 7.5 | 41.3 | 74.6 | 50.7 | 26.8 | 46.2 |
| 1964 | 7.8 | 45.7 | 76.3 | 53.3 | 30.3 | 49.5 |
| 1965 | 8.2 | 46.8 | 78.1 | 54.1 | 31.1 | 50.6 |
| 1966 | 8.3 | 45.8 | 77.9 | 54.3 | 30.4 | 49.5 |
| 1967 | 8.4 | 49.9 | 79.6 | 57.1 | 34.1 | 54.6 |
| 1968 | 9.1 | 50.9 | 82.2 | 60.3 | 32.6 | 55.4 |
| 1969 | 10.2 | 52.2 | 88.2 | 64.3 | 33.8 | 56.2 |
| 1970 | 10.3 | 52.9 | 90.7 | 65.9 | 33.9 | 57.2 |
| 1971 | 12.1 | 56.3 | 93.4 | 68.5 | 35.7 | 60.3 |
| 1972 | 12.3 | 58.7 | 96.5 | 69.1 | 38.1 | 63.0 |
| 1973 | 23.6 | 66.1 | 108.6 | 80.4 | 42.5 | 69.8 |
| 1974 | 25.2 | 75.8 | 111.9 | 92.6 | 58.0 | 80.4 |
| 1975 | 43.3 | 104.6 | 129.6 | 110.1 | 94.9 | 108.9 |
| 1976 | 44.5 | 111.7 | 136.4 | 118.7 | 99.7 | 116.4 |
| 1977 | 71.9 | 157.6 | 181.6 | 158.4 | 155.8 | 164.1 |

Source: United States Department of Energy, Energy Information Administration, *Energy Data Reports*, "Natural Gas Production and Consumption", annual.

[1]Average prices were computed as annual total value divided by annual gas volume. Wellhead price corresponds to marketed production; retail price corresponds to total consumption.

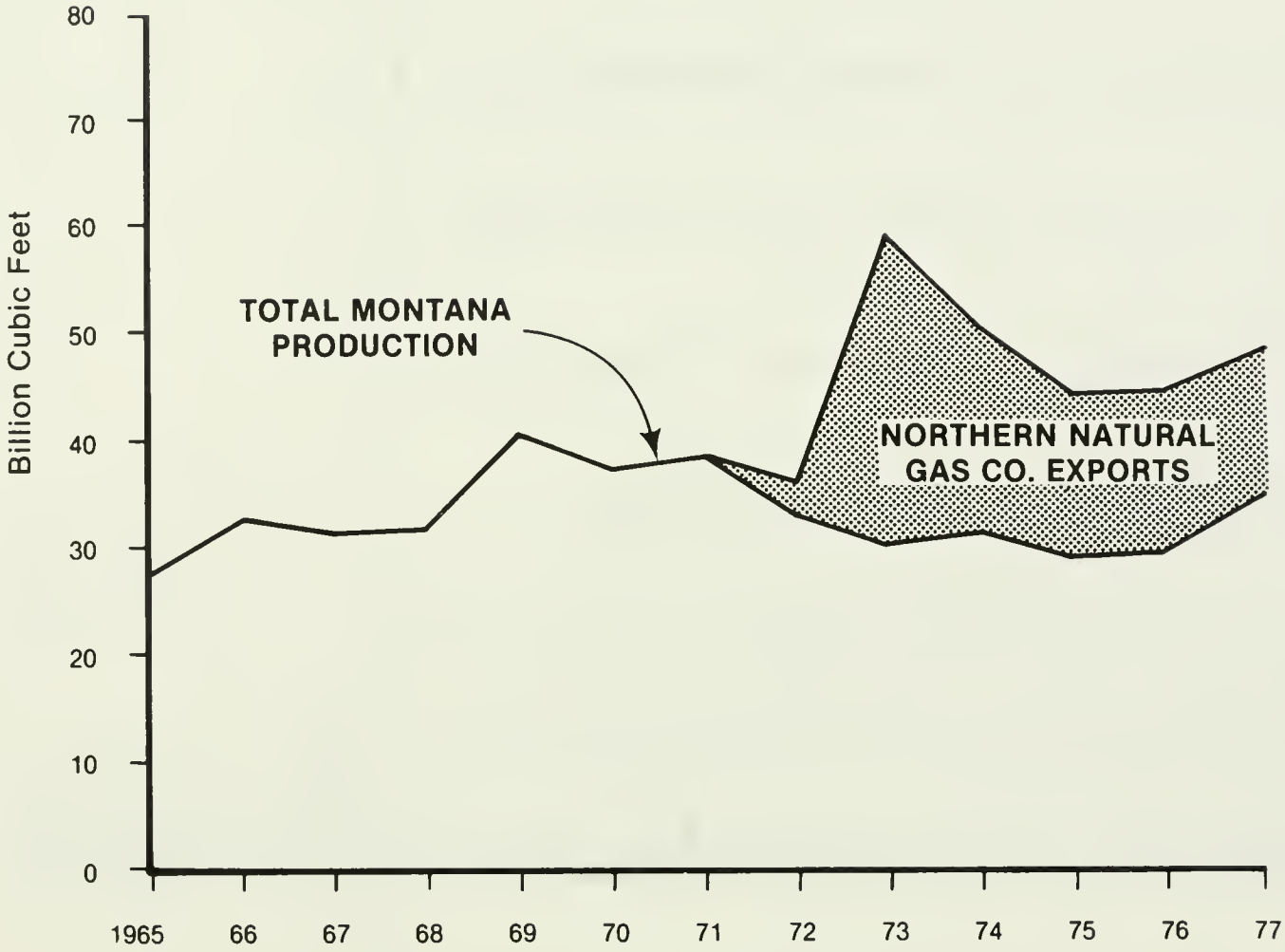



**FIGURE 4.4 MONTANA NATURAL GAS PRODUCTION AND EXPORTS, 1965-77**

## TABLE 4.6
## NATURAL GAS PRODUCTION AND CONSUMPTION IN MONTANA (million cubic feet)

| | Gross Withdrawal | Marketed Production | Consumption | GAS DELIVERED | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Residential | Commercial | Industrial | Electric Utilities | Other | Total |
| 1950 | 40975 | 38972 | 38333 | 12596 | 7536 | 13979 | 892 | NA | 35002 |
| 1951 | 36897 | 36225 | 37276 | 12287 | 7379 | 15047 | 884 | NA | 35598 |
| 1952 | 29140 | 28557 | 41545 | 12263 | 7794 | 17422 | 998 | NA | 38476 |
| 1953 | 28245 | 27736 | 40953 | 12029 | 7544 | 16559 | 1237 | NA | 37368 |
| 1954 | 30532 | 30087 | 41002 | 13314 | 8277 | 14909 | 601 | NA | 37101 |
| 1955 | 28841 | 28100 | 47861 | 15335 | 9427 | 18240 | 630 | NA | 43631 |
| 1956 | 26852 | 25706 | 48305 | 15235 | 9314 | 18226 | 876 | NA | 43651 |
| 1957 | 30830 | 28481 | 54868 | 16725 | 10116 | 18429 | 2954 | NA | 48224 |
| 1958 | 30830 | 27836 | 54725 | 14970 | 9546 | 18960 | 3183 | NA | 46659 |
| 1959 | 32819 | 30575 | 51898 | 17310 | 11124 | 16438 | 1005 | NA | 45877 |
| 1960 | 37792 | 33235 | 54271 | 16825 | 11820 | 19558 | 339 | NA | 48543 |
| 1961 | 36798 | 33716 | 57465 | 17086 | 12140 | 21404 | 354 | NA | 50985 |
| 1962 | 32621 | 29791 | 62952 | 17078 | 12302 | 21713 | 3692 | NA | 54785 |
| 1963 | 31228 | 29862 | 66969 | 17274 | 12569 | 24613 | 3285 | NA | 57740 |
| 1964 | 26653 | 25050 | 67282 | 18792 | 13059 | 26419 | 2437 | NA | 60706 |
| 1965 | 29800 | 28105 | 70895 | 19908 | 14110 | 28310 | 1992 | NA | 64320 |
| 1966 | 36048 | 30685 | 73829 | 19690 | 14068 | 29571 | 2977 | NA | 66306 |
| 1967 | 31610 | 25866 | 65782 | 19756 | 13090 | 22584 | 502 | 2426 | 58358 |
| 1968 | 32229 | 19313 | 63642 | 19711 | 11529 | 23155 | 631 | 2122 | 57148 |
| 1969 | 68064 | 41229 | 78988 | 21463 | 14239 | 31917 | 1520 | 2354 | 71493 |
| 1970 | 48302 | 42705 | 90823 | 24794 | 15520 | 36105 | 2529 | 3044 | 81992 |
| 1971 | 38136 | 32720 | 89021 | 25379 | 15734 | 36800 | 1075 | 2375 | 81363 |
| 1972 | 38137 | 33474 | 85161 | 23787 | 16521 | 33192 | 1218 | 2630 | 77348 |
| 1973 | 60931 | 56175 | 91148 | 24923 | 16786 | 37898 | 2322 | 2357 | 84286 |
| 1974 | 59524 | 54873 | 80766 | 21590 | 14353 | 35202 | 1111 | 2249 | 74505 |
| 1975 | 44547 | 40734 | 80351 | 24097 | 16233 | 31631 | 1059 | 2421 | 75441 |
| 1976 | 45097 | 42563 | 78094 | 23525 | 15490 | 31049 | 709 | 2341 | 73114 |
| 1977 | 44502 | 46819 | 70956 | 21596 | 14626 | 27260 | 953 | 2080 | 66515 |

Source: United States Department of Energy, Energy Information Administration, Energy Data Reports, *Natural Gas Production and Consumption Annual.*

Note: See Note 4.6 in Appendix.

## TABLE 4.7
## CAPACITY AND PRODUCTION OF NATURAL GAS PROCESSING PLANTS IN MONTANA

| | NUMBER OF PLANTS | INPUT (MMCF/day) | | AVERAGE PRODUCTION FOR 12 MONTHS (gallons/day) | | | | | | | OIL & GAS JOURNAL ISSUE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Gas Capacity | Gas Through Put | Propane | Normal Butane | Liquid Petroleum Gas Mix | Raw Natural Gas Liquid Mix | Debutanized Natural Gasoline | Other | Total Products | |
| 1961 | 2 | 66.2 | 32.0 | 8,000 | 8,600 | — | 39,400 | — | — | 56,000 | 4/30/62 |
| 1962 | 2 | 65.8 | 27.4 | 9,400 | 8,000 | — | 37,000 | — | — | 54,400 | 3/25/63 |
| 1963 | 2 | 65.8 | 21.9 | 6,100 | 6,400 | — | 32,200 | — | — | 44,700 | 3/16/64 |
| 1964 | 2 | 55.8 | 23.3 | 6,800 | 7,600 | — | 38,700 | — | — | 53,100 | 3/29/65 |
| 1965 | 2 | 55.8 | 24.3 | 3,700 | 8,900 | — | 38,400 | — | — | 51,000 | 5/02/66 |
| 1966 | 5 | 66.8 | 32.9 | 30,800 | 9,200 | 6,000 | 77,240 | — | — | 123,240 | 3/20/67 |
| 1967 | 5 | 360.9 | 272.9 | 23,325 | 9,000 | 25,370 | 47,155 | — | — | 104,850 | 3/25/68 |
| 1968 | 5 | 107.8 | 82.5 | 32,500 | 9,000 | 15,000 | 54,900 | — | — | 111,400 | 4/07/69 |
| 1969 | 4 | 68.8 | 57.0 | 37,500 | 9,000 | 15,000 | 75,000 | — | — | 136,500 | 7/13/70 |
| 1970 | 7 | 75.8 | 42.7 | 40,800 | 11,000 | — | 60,500 | 35,680 | — | 147,980 | 7/12/71 |
| 1971 | 6 | 73.3 | 40.3 | 33,550 | 9,400 | 6,000 | 59,400 | 9,590 | — | 117,940 | 7/10/72 |
| 1972 | 4 | 44.3 | 29.6 | 24,900 | 9,400 | — | 43,500 | 9,500 | — | 87,390 | 7/09/73 |
| 1973 | 4 | 44.3 | 21.3 | 28,727 | 6,026 | 17,000 | 13,576 | — | — | 65,329 | 7/08/74 |
| 1974 | 4 | 45.3 | 20.6 | 30,786 | 8,260 | — | 9,000 | 10,466 | 17,000 | 75,512 | 7/14/75 |
| 1975 | 4 | 44.3 | 26.1 | 31,200 | 9,100 | — | 9,000 | 8,350 | 16,000 | 73,650 | 7/05/76 |
| 1976 | 8 | 56.3 | 28.5 | 30,300 | 9,600 | 24,000 | 16,000 | 22,600 | — | 102,500 | 7/11/77 |
| 1977 | 6 | 53.5 | 30.6 | 20,800 | 12,200 | 17,000 | 16,600 | 10,500 | — | 77,100 | 7/10/78 |

Source: *Oil and Gas Journal*, Annual Gas Processing Survey.

## TABLE 4.8
## CONSUMPTION OF NATURAL GAS BY MINING AND MANUFACTURING IN MONTANA IN 1977
## (million cubic feet)

| SIC CODE | | 1977 CONSUMPTION | | |
|---|---|---|---|---|
| | | Firm | Interruptible | Total |
| 10-14 | Mining | — | 711 | 711 |
| 20 | Food and Kindred Products | 132 | 2,123 | 2,255 |
| 24 | Lumber and Wood Products | 471 | 840 | 1,311 |
| 26 | Paper and Allied Products | — | 3,601 | 3,601 |
| 27 | Printing and Publishing | 188 | — | 188 |
| 28 | Chemicals and Allied | — | 1,377 | 1,377 |
| 29 | Petroleum and Coal Products | 973 | 4,072 | 5,045 |
| 32 | Stone, Clay, Glass, and Concrete Products | 49 | 2,199 | 2,248 |
| 333-339 | Primary Non-ferrous Metals | — | 8,069 | 8,069 |
| 37 | Transportation Equipment | — | 314 | 314 |
| | Not classified/unreported | 668 | — | 668 |
| | **TOTAL CONSUMPTION** | **2,501** | **23,306** | **25,807** |

Source: Gas Requirements Agency, University of Denver Research Institute, *United States Gas Consumption 1977*, September 1978, p. 10

# 5

# CRUDE PETROLEUM AND PETROLEUM PRODUCTS

## HIGHLIGHTS

- Montana's proved reserve of crude oil was estimated by the Oil and Gas Division of the Department of Natural Resources and Conservation at 233 million barrels as of January 1, 1978, unchanged from a year earlier.
- Crude oil production totaled 32,680,000 barrels in 1977, down slightly from 1976.
- The average wellhead price for crude oil was $8.58 in 1977, compared with $8.42 in 1976.
- Montana refineries processed 48,297,000 barrels of crude oil in 1977, down 4 percent from the previous year.
- During 1978, 14,171,000 barrels of gasoline were manufactured in Montana, compared with 13,654,000 barrels in 1977 and 16,281,000 barrels in 1976.
- Sales of gasoline totaled 12,495,000 barrels in 1978, compared with 12,040,000 barrels in 1977 and 11,722,000 barrels in 1976.

## TABLES


| Table | | Page |
|---|---|---|
| 5.1 | Proved Reserves of Crude Oil in the United States and Montana 1950-77 | 48 |
| 5.2 | Estimate of Montana Crude Oil Proved Reserves by Region, January 1, 1978 | 49 |
| 5.3 | Crude Oil Production and Average Wellhead Prices in Montana | 50 |
| 5.4 | Crude Oil Refined in Montana Refineries by Source | 52 |
| 5.5 | Total Crude Oil Refined in Montana by Source | 56 |
| 5.6 | Consumption of Motor Fuels in Montana | 58 |
| 5.7 | Production and Consumption of Gasoline in Montana | 59 |
| 5.8 | Sales of Petroleum Products in Montana | 60 |
| 5.9 | Sales of Residual Fuel Oil in Montana by Sector | 61 |
| 5.10 | Sales of Distillate Fuel Oil in Montana by Sector | 62 |
| 5.11 | Sales of LPG in Montana by Sector | 63 |
| 5.12 | Distribution of Montana Crude Oil Exports by State of Destination | 64 |


## FIGURES


| Figure | | Page |
|---|---|---|
| 5.1 | Supply of Crude Oil in Montana in 1977 | 51 |
| 5.2 | Petroleum Refined in Montana, by Source | 57 |

## TABLE 5.1
## PROVED RESERVES OF CRUDE OIL IN THE UNITED STATES AND MONTANA 1950-77
## (1000 barrels)

| | YEAR-END PROVED RESERVES[1] | |
|---|---|---|
| | United States | Montana |
| 1950 | 25,268,398 | 111,272 |
| 1951 | 27,468,031 | 108,418 |
| 1952 | 27,960,554 | 156,181 |
| 1953 | 28,944,828 | 208,985 |
| 1954 | 29,560,746 | 272,394 |
| 1955 | 30,012,170 | 298,948 |
| 1956 | 30,434,649 | 331,414 |
| 1957 | 30,300,405 | 319,991 |
| 1958 | 30,535,917 | 337,799 |
| 1959 | 31,719,347 | 309,268 |
| 1960 | 31,613,211 | 266,687 |
| 1961 | 31,758,505 | 250,909 |
| 1962 | 31,389,223 | 248,860 |
| 1963 | 30,969,990 | 271,253 |
| 1964 | 30,990,510 | 251,620 |
| 1965 | 31,352,391 | 274,145 |
| 1966 | 31,452,127 | 281,608 |
| 1967 | 31,376,670 | 307,972 |
| 1968 | 30,707,117 | 345,117 |
| 1969 | 29,631,862 | 275,765 |
| 1970 | 39,001,335 | 241,529 |
| 1971 | 38,062,957 | 228,185 |
| 1972 | 36,339,408 | 241,248 |
| 1973 | 35,299,839 | 219,343 |
| 1974 | 34,249,956 | 207,389 |
| 1975 | 32,682,127 | 163,968 |
| 1976 | 30,942,166 | 152,670 |
| 1977 | 29,486,402 | 151,601 |

Source: American Gas Association, *Gas Facts,* Arlington, VA.

[1]Proved reserves are the estimated amounts of oil that geologic and engineering data indicate are recoverable from known reservoirs under present economic and operating conditions.

## TABLE 5.2
## ESTIMATE OF MONTANA CRUDE OIL PROVED RESERVES BY REGION, JANUARY 1, 1978

| Region | Proved Reserves (million barrels) | Percentage of Total |
|---|---|---|
| Northeastern Montana | 52.3 | 22 |
| Southeastern Montana | 99.0 | 43 |
| Central Montana | 30.6 | 13 |
| South Central Montana | 10.0 | 4 |
| Northern Montana | 41.1 | 18 |
| **STATE TOTAL** | **233.0** | **100** |

Source: Montana Department of Natural Resources and Conservation, Oil and Gas Conservation Division, *Annual Review for 1977*, Volume 21.

## TABLE 5.3
## CRUDE OIL PRODUCTION AND AVERAGE WELLHEAD PRICES IN MONTANA

| | Production[1] of Crude Oil (1000 barrels) | Wellhead[2] Price (dollars per barrel) | Production[3] of Crude Oil (1000 barrels) | Wellhead[3] Price (dollars per barrel) |
|---|---|---|---|---|
| 1950 | 8109 | 2.52 | 7841 | 2.47 |
| 1951 | 8958 | 2.47 | 8814 | 2.35 |
| 1952 | 9606 | 2.25 | 9527 | 2.26 |
| 1953 | 11920 | 2.18 | 11793 | 2.23 |
| 1954 | 14195 | 2.20 | 14023 | 2.22 |
| 1955 | 15654 | 2.26 | 16548 | 2.18 |
| 1956 | 21760 | 2.58 | 21262 | 2.47 |
| 1957 | 27122 | 2.70 | 26658 | 2.43 |
| 1958 | 27957 | 2.65 | 27816 | 2.62 |
| 1959 | 29857 | 2.56 | 29985 | 2.50 |
| 1960 | 30240 | 2.41 | 29937 | 2.45 |
| 1961 | 30906 | 2.42 | 30499 | 2.42 |
| 1962 | 31648 | 2.42 | 31270 | 2.44 |
| 1963 | 30870 | 2.44 | 30364 | 2.44 |
| 1964 | 30647 | 2.43 | 30241 | 2.45 |
| 1965 | 32778 | 2.43 | 32089 | 2.44 |
| 1966 | 35380 | 2.44 | 34734 | 2.45 |
| 1967 | 34959 | 2.50 | 34316 | 2.50 |
| 1968 | 48460 | 2.57 | 47152 | 2.56 |
| 1969 | 43954 | 2.69 | 44446 | 2.76 |
| 1970 | 37879 | 2.78 | 38058 | 2.83 |
| 1971 | 34599 | 3.01 | 34625 | 3.05 |
| 1972 | 33904 | 3.07 | 34572 | 2.99 |
| 1973 | 34620 | 3.33 | 34584 | 3.85 |
| 1974 | 34554 | 6.65 | 34629 | 6.82 |
| 1975 | 32844 | 7.83 | 32815 | 7.83 |
| 1976 | 32814 | 8.42 | 32057 | 8.49 |
| 1977 | 32680 | 8.58 | 30696 | 9.07 |

Note: Crude oil production figures compiled by Montana's Oil and Gas Conservation Division are also reported by the U. S. Bureau of Mines. Average wellhead prices were computed as total value of production divided by total volume produced.

[1]Source: Montana Oil and Gas Conservation Division.

[2]Source: U. S. Department of Energy, Energy Information Administration.

[3]Source: Montana Department of Revenue, Property Assessment Division.

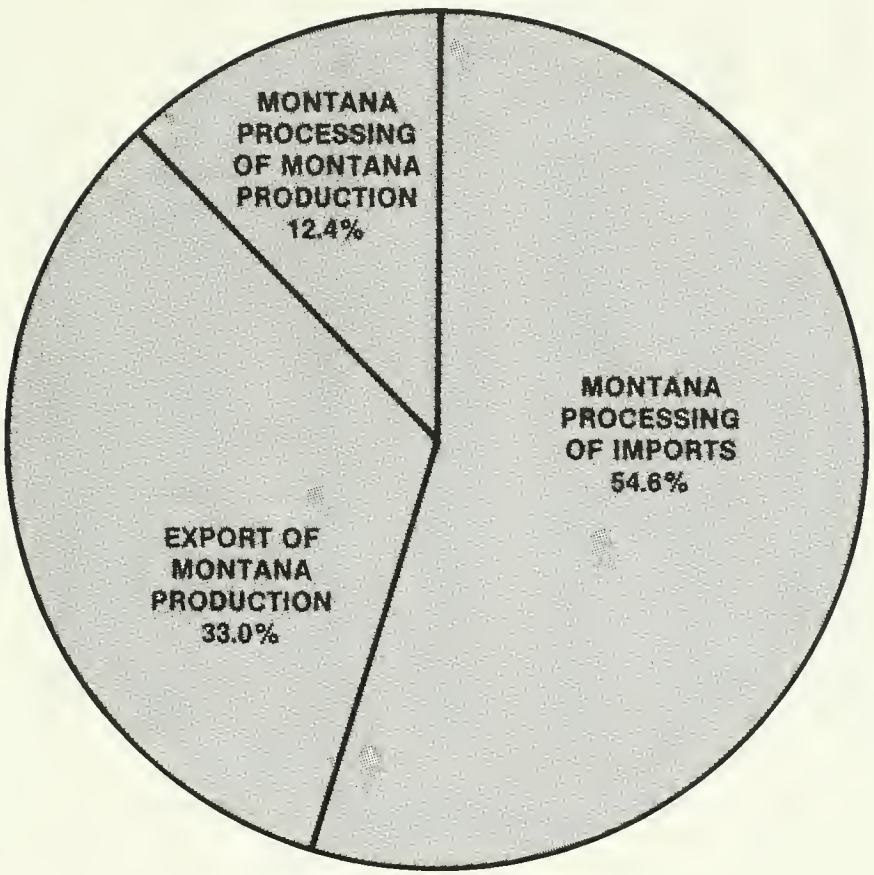



FIGURE 5.1 SUPPLY OF CRUDE OIL IN MONTANA IN 1977

## TABLE 5.4
## CRUDE OIL REFINED IN MONTANA REFINERIES BY SOURCE
## (1000 barrels)

| | CONTINENTIAL OIL (Billings) | | | | EXXON (Billings)[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | Montana | Wyoming | Canada | Total | Montana | Wyoming | Canada | Total |
| 1953 | 337 | 2753 | | 3089 | 1067 | 6277 | | 7344 |
| 1954 | 623 | 2277 | | 2909[2] | 1641 | 5355 | | 6995 |
| 1955 | 1268 | 2077 | | 3358[2] | 1778 | 5225 | | 7004 |
| 1956 | 560 | 2671 | | 3231 | 1352 | 7095 | | 8447 |
| 1957 | 681 | 2795 | | 3475 | 1777 | 6602 | | 8378 |
| 1958 | 807 | 2313 | | 3120 | 2316 | 4445 | | 6792 |
| 1959 | 971 | 2793 | | 3765 | 4414 | 6760 | | 11173 |
| 1960 | 728 | 3422 | | 4151 | 3634 | 6175 | | 9808 |
| 1961 | 729 | 3955 | | 4685 | 3583 | 5991 | | 9574 |
| 1962 | 1954 | 3434 | 185 | 5573 | 2519 | 9496 | 12 | 12028 |
| 1963 | 2418 | 2241 | 1046 | 5705 | 2200 | 8739 | 495 | 11435 |
| 1964 | 3732 | 1548 | 3692 | 8973 | 2275 | 9530 | 288 | 12093 |
| 1965 | 2697 | 3068 | 4593 | 10359 | 2293 | 9659 | 37 | 11989 |
| 1966 | 1773 | 4148 | 4674 | 10595 | 2318 | 9557 | 0 | 11875 |
| 1967 | 1813 | 3936 | 5052 | 10802 | 2073 | 11851 | 0 | 13924 |
| 1968 | 1714 | 1995r | 10125r | 13834 | 1451 | 12387 | 222 | 14060 |
| 1969 | 1637 | 3443r | 8482r | 13562 | 1240 | 11964 | 360 | 13564 |
| 1970 | 1351 | 3345r | 9123r | 13820 | 1090 | 11062 | 2381 | 14532 |
| 1971 | 1170 | 3592r | 10070r | 14833 | 1046 | 10997 | 2564 | 14607 |
| 1972 | 1119 | 3796r | 12240r | 17154 | 849 | 10821 | 3706 | 15376 |
| 1973 | 1046 | 3272r | 12170r | 16488 | 1089 | 10011 | 5568 | 16668 |
| 1974 | 1340 | 4299r | 11113r | 16752 | 744 | 8753 | 4870 | 14367 |
| 1975 | 1703 | 5478r | 9291r | 16472 | 879 | 8615 | 5606 | 15100 |
| 1976 | 1846 | 4495 | 11125 | 17466 | 1005 | 7719 | 5818 | 14542 |
| 1977 | 3153 | 3558 | 10064 | 16776 | 521 | 8211 | 5234 | 13967 |

## TABLE 5.4 (continued)
## CRUDE OIL REFINED IN MONTANA REFINERIES BY SOURCE
## (1000 barrels)

| | FARMERS UNION (Laurel) | | | | | BIG WEST OIL (Kevin) | | |
|---|---|---|---|---|---|---|---|---|
| | Montana | Wyoming | North Dakota | Canada | Total | Montana | Canada | Total |
| 1953 | 949 | 3083 | | | 4032 | 686 | | 686 |
| 1954 | 1618 | 3234 | | | 4853 | 652 | | 652 |
| 1955 | 1446 | 3908 | | | 5354 | 705 | | 705 |
| 1956 | 1916 | 3936 | | | 5852 | 729 | | 729 |
| 1957 | 1830 | 4249 | | | 6078 | 742 | | 742 |
| 1958 | 1395 | 3113 | | | 4509 | 751 | | 751 |
| 1959 | 1215 | 5589 | | | 6804 | 805 | | 805 |
| 1960 | 2008 | 4786 | | | 6794 | 775 | | 775 |
| 1961 | 1859 | 4092 | | | 5951 | 831 | | 831 |
| 1962 | 2754 | 3740 | | | 6495 | 852 | 3 | 855 |
| 1963 | 2974 | 3425 | | | 6699 | 916 | | 916 |
| 1964 | 2723 | 4603 | | | 7326 | 920 | | 920 |
| 1965 | 2635 | 3665 | | | 6300 | 1034 | | 1034 |
| 1966 | 2079 | 4415 | | | 6494 | 765 | | 765 |
| 1967 | 1833 | 5606 | | | 7439 | 967 | | 967 |
| 1968 | 1264 | 6533 | | | 7797 | 1290 | | 1290 |
| 1969 | 1539 | 6723 | | | 8261 | 1101 | | 1101 |
| 1970 | 1355 | 4935 | | 2404 | 8695 | 1207 | | 1207 |
| 1971 | 1526 | 5143 | | 3369 | 10038 | 1136 | | 1136 |
| 1972 | 1703 | 4625 | | 4229 | 10556 | 523r | 705r | 1228r |
| 1973 | 1672 | 4952 | | 5299 | 11922 | 675r | 784r | 1469 |
| 1974 | 1599 | 3897 | | 5697 | 11192 | 519r | 940r | 1459 |
| 1975 | 1466 | 5373 | | 4339 | 11178 | 398r | 820r | 1218r |
| 1976 | 1200 | 6097 | | 5354 | 12651 | 565 | 658 | 1223 |
| 1977 | 903 | 6478 | 193 | 5105 | 12679 | 110 | 200 | 310 |

## TABLE 5.4 (continued)
## CRUDE OIL REFINED IN MONTANA REFINERIES BY SOURCE
## (1000 barrels)

| | PHILLIPS (Great Falls) | | | TESORO (Wolf Point)[3] | | | WESTCO (Cut Bank)[4] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Montana | Canada | Total | Montana | Canada | Total | Montana | Canada | Total |
| 1953 | 857 | | 857 | | | | 1305 | | 1305 |
| 1954 | 839 | | 839 | | | | 1252 | | 1252 |
| 1955 | 874 | | 874 | | | | 1279 | | 1279 |
| 1956 | 997 | 7 | 1004 | 86 | | 86 | 1257 | 47 | 1304 |
| 1957 | 831 | 16 | 847 | 98 | | 98 | 1258 | 54 | 1312 |
| 1958 | 995 | | 995 | 45 | | 45 | 1203 | 12 | 1215 |
| 1959 | 1226 | | 1226 | 55 | | 55 | 1175 | 4 | 1180 |
| 1960 | 1298 | | 1298 | 17 | | 17 | 1142 | 21 | 1162 |
| 1961 | 1318 | | 1318 | 0 | | 0 | 1099 | 14 | 1114 |
| 1962 | 1436 | | 1436 | 0 | | 0 | 1050 | 41 | 1091 |
| 1963 | 1616 | | 1616 | 0 | | 0 | 1130 | 11 | 1141 |
| 1964 | 1491 | | 1491 | 78 | | 78 | 880 | 21 | 901 |
| 1965 | 1500 | | 1500 | 508 | | 508 | 1134 | 24 | 1158 |
| 1966 | 1619 | | 1619 | 681 | | 681 | 1159 | 9 | 1169 |
| 1967 | 1770 | | 1770 | 747 | | 747 | 1191 | | 1191 |
| 1968 | 1690 | | 1690 | 820 | | 820 | 1258 | | 1258 |
| 1969 | 1609 | | 1609 | 861 | | 861 | 1274 | | 1274 |
| 1970 | 1691 | | 1691 | 806 | | 806 | 1388 | | 1388 |
| 1971 | 1955 | | 1955 | 843 | | 843 | 1371 | | 1371 |
| 1972 | 2120 | | 2120 | 765 | | 765 | 954r | 276r | 1230r |
| 1973 | 2220 | | 2220 | 668 | | 668 | 1057r | 464r | 1513r |
| 1974 | 2056 | 81 | 2136 | 590 | 23 | 613 | 1142r | 392r | 1534r |
| 1975 | 1724 | 433 | 2158 | 687 | 4 | 690 | 1145r | 166r | 1311r |
| 1976 | 1557 | 539 | 2076 | 959 | | 959 | 1406 | | 1406 |
| 1977 | 1809 | 317 | 2126 | 908 | 7[5] | 916 | 1524 | | 1524 |

## TABLE 5.4 (continued)
## CRUDE OIL REFINED IN MONTANA REFINERIES BY SOURCE
## (1000 barrels)

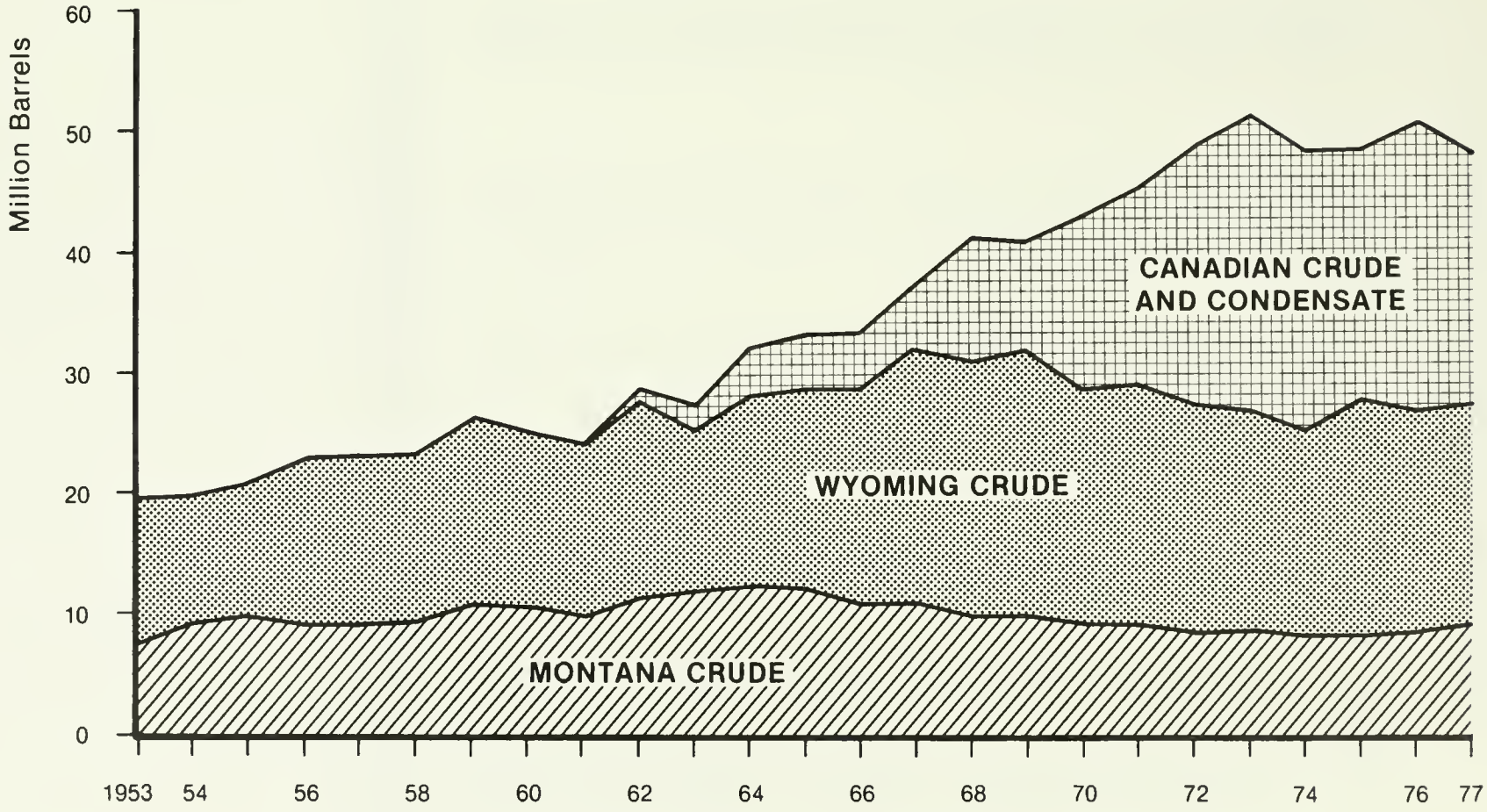
| | DIAMOND ASPHALT (Chinook) | | | JET FUEL REFINERY (Mosby) | | | OTHER REFINERIES[6] | |
|---|---|---|---|---|---|---|---|---|
| | Montana | Canada | Total | Montana | Wyoming | Total | Montana | Total |
| 1953 | 0 | | 0 | 26 | | 26 | 2272 | 2272 |
| 1954 | 74 | | 74 | 175 | | 175 | 2161 | 2161 |
| 1955 | 241 | | 241 | 127 | | 127 | 2139 | 2139 |
| 1956 | 215 | 33 | 249 | 113 | 18 | 131 | 1828 | 1828 |
| 1957 | 195 | 10 | 205 | 138 | 20 | 158 | 1673 | 1685[7] |
| 1958 | 202 | | 202 | 121 | 5 | 127 | 1299 | 1299 |
| 1959 | 277 | | 277 | 179 | | 179 | 595 | 595 |
| 1960 | 218 | | 218 | 116 | | 116 | 595 | 595 |
| 1961 | 236 | 19 | 255 | 110 | | 110 | 31 | 31 |
| 1962 | 186 | 22 | 207 | 51 | 37 | 92[8] | 373 | 373 |
| 1963 | 148 | | 148 | 326 | 40 | 366 | 70 | 70 |
| 1964 | 95 | | 95 | 57 | | 57 | 41 | 41 |
| 1965 | 111 | | 111 | 58 | | 58 | | |
| 1966 | 165 | | 165 | 66 | | 66 | | |
| 1967 | 173 | | 173 | 65 | | 65 | | |
| 1968 | 173 | | 173 | 30 | | 30 | | |
| 1969 | 174 | | 174 | 30 | | 30 | | |
| 1970 | 158 | | 158 | 34 | | 34 | | |
| 1971 | 190 | | 190 | 25 | | 25 | | |
| 1972 | 144 | | 144 | 19 | | 19 | | |
| 1973 | 3 | | 3 | 7 | | 7 | | |
| 1974 | 0 | | 0 | 0 | | 0 | | |
| 1975 | 0 | | 0 | 0 | | 0 | | |
| 1976 | 0 | | 0 | 0 | | 0 | | |
| 1977 | 0 | | 0 | 0 | | 0 | | |

[1]Formerly Humble Oil (1960-72) and Carter Oil (1953-59).
[2]Includes 9,000 barrels from South Dakota in 1954 and 13,000 barrels from South Dakota in 1955.
[3]Formerly Texstar Petroleum (1959-64) and the Texas-Calgary Co. (1956-58).
[4]Formerly Union Oil Company (1953-70).
[5]North Dakota oil imported in 1977.
[6]Includes Modern Oil Company (1953-54), Texaco Incorporated (1953-60), Unity Petroleum Company (1957-58), PetroFuels Company (1961-64), and North Star Refinery (1964).
[7]Includes 12,000 barrels to Unity Petroleum Company from Canada in 1957.
[8]Includes 4,000 barrels from Canada in 1962.
r Revised by the Montana Energy Advisory Council.

# TABLE 5.5
# TOTAL CRUDE OIL REFINED IN MONTANA BY SOURCE
## (1000 barrels)

| | MONTANA | | WYOMING | | CANADA | | NORTH DAKOTA | | |
|---|---|---|---|---|---|---|---|---|---|
| | Crude Oil Refined in Montana | Percentage of Total | Crude Oil Refined in Montana | Percentage of Total | Crude Oil Refined in Montana | Percentage of Total | Crude Oil Refined in Montana | Percentage of Total | TOTAL |
| 1953 | 7497 | 38.3 | 12112 | 61.7 | 0 | 0.0 | 0 | 0.0 | 19609 |
| 1954 | 9034 | 45.4 | 10865 | 54.5 | 0 | 0.0 | 0 | 0.0 | 19909[1] |
| 1955 | 9858 | 46.8 | 11210 | 53.1 | 0 | 0.0 | 0 | 0.0 | 21081[1] |
| 1956 | 9053 | 39.6 | 13720 | 60.0 | 88 | 0.4 | 0 | 0.0 | 22861 |
| 1957 | 9222 | 40.1 | 13665 | 59.5 | 92 | 0.4 | 0 | 0.0 | 22979 |
| 1958 | 9165 | 39.4 | 14089 | 60.5 | 12 | 0.1 | 0 | 0.0 | 23265 |
| 1959 | 10913 | 41.9 | 15141 | 58.1 | 4 | 0.0 | 0 | 0.0 | 26059 |
| 1960 | 10531 | 42.3 | 14383 | 57.7 | 21 | 0.1 | 0 | 0.0 | 24935 |
| 1961 | 9797 | 41.0 | 14038 | 58.8 | 33 | 0.1 | 0 | 0.0 | 23869 |
| 1962 | 11175 | 39.7 | 16708 | 59.4 | 266 | 0.9 | 0 | 0.0 | 28149 |
| 1963 | 11798 | 42.0 | 14745 | 52.5 | 1553 | 5.5 | 0 | 0.0 | 28097 |
| 1964 | 12292 | 38.4 | 15714 | 49.1 | 4002 | 12.5 | 0 | 0.0 | 32007 |
| 1965 | 11971 | 36.2 | 16416 | 49.7 | 4654 | 14.1 | 0 | 0.0 | 33041 |
| 1966 | 10626 | 31.8 | 18120 | 54.2 | 4684 | 14.0 | 0 | 0.0 | 33429 |
| 1967 | 10632 | 28.7 | 21393 | 57.7 | 5052 | 13.6 | 0 | 0.0 | 37078 |
| 1968 | 9690 | 23.7 | 20915r | 51.0 | 10347r | 25.2 | 0 | 0.0 | 40951 |
| 1969 | 9465 | 23.4 | 22130r | 54.7 | 8843r | 21.9 | 0 | 0.0 | 40438 |
| 1970 | 9080 | 21.5 | 19342r | 45.7 | 13908r | 32.8 | 0 | 0.0 | 42330 |
| 1971 | 9262 | 20.6 | 19732r | 43.8 | 16003r | 35.6 | 0 | 0.0 | 44997 |
| 1972 | 8194r | 16.9 | 19241r | 39.6 | 21156r | 43.5 | 0 | 0.0 | 48591r |
| 1973 | 8437r | 16.6 | 18235r | 35.8 | 24295r | 47.7 | 0 | 0.0 | 50967r |
| 1974 | 7989r | 16.6 | 16949r | 35.3 | 23115r | 48.1 | 0 | 0.0 | 48053 |
| 1975 | 8002r | 16.6 | 19465r | 40.4 | 20690r | 43.0 | 0 | 0.0 | 48157r |
| 1976 | 8517 | 16.9 | 18311 | 36.4 | 23494 | 46.7 | 0 | 0.0 | 50322 |
| 1977 | 8928 | 18.5 | 18248 | 37.8 | 20921 | 43.3 | 200 | 0.4 | 48297 |

Source: Montana Department of Natural Resources, Oil and Gas Division, *Annual Review for the Year*, various years.
Note: See Note 5.5 in Appendix.
[1]Includes 9,000 barrels from South Dakota in 1954 and 13,000 barrels from South Dakota in 1955.
r Revised by the Montana Energy Advisory Council.




NOTE: Not shown are the 200,000 barrels of North Dakota crude refined in Montana in 1977.

**FIGURE 5.2 PETROLEUM REFINED IN MONTANA, BY SOURCE**

# TABLE 5.6
# CONSUMPTION OF MOTOR FUELS IN MONTANA
## (1000 barrels)

| | HIGHWAY USE OF MOTOR FUEL | | | Nonhighway Use of Motor Fuel | Losses due to evaporation, handling, etc. | Total Use of Motor Fuel |
|---|---|---|---|---|---|---|
| | Gasoline | Diesel and LPG | Total | | | |
| 1950 | 4,027 | 181 | 4,208 | 1,262 | 83 | 5,553 |
| 1951 | 4,410 | 231 | 4,641 | 1,038 | 85 | 5,764 |
| 1952 | 4,482 | 295 | 4,777 | 1,370 | 92 | 6,239 |
| 1953 | 5,123 | 337 | 5,460 | 911 | 93 | 6,464 |
| 1954 | 4,870 | 405 | 5,275 | 1,401 | 96 | 6,772 |
| 1955 | 5,047 | 412 | 5,459 | 1,436 | 94 | 6,989 |
| 1956 | 5,569 | 421 | 5,990 | 1,271 | 103 | 7,364 |
| 1957 | 5,302 | 475 | 5,777 | 1,554 | 69 | 7,400 |
| 1958 | 5,703 | 513 | 6,216 | 1,193 | 70 | 7,479 |
| 1959 | 5,694 | 627 | 6,321 | 1,535 | 72 | 7,928 |
| 1960 | 5,772 | 648 | 6,420 | 1,666 | 75 | 8,161 |
| 1961 | 5,726 | 744 | 6,470 | 2,124 | 80 | 8,674 |
| 1962 | 6,525 | 722 | 7,247 | 986 | 87 | 8,320 |
| 1963 | 6,373 | 796 | 7,169 | 1,118 | 89 | 8,376 |
| 1964 | 6,504 | 840 | 7,344 | 1,016 | 86 | 8,446 |
| 1965 | 6,683 | 926 | 7,609 | 1,164 | 93 | 8,866 |
| 1966 | 7,063 | 1,030 | 8,093 | 970 | 90 | 9,153 |
| 1967 | 7,148 | 968 | 8,116 | 1,049 | 95 | 9,260 |
| 1968 | 7,654 | 1,089 | 8,743 | 967 | 96 | 9,806 |
| 1969 | 8,166 | 1,187 | 9,353 | 664 | 97 | 10,114 |
| 1970 | 8,397 | 1,384 | 9,781 | 944 | 101 | 10,826 |
| 1971 | 8,862 | 1,459 | 10,321 | 794 | 101 | 11,216 |
| 1972 | 9,393 | 1,646 | 11,039 | 1,004 | 104 | 12,147 |
| 1973 | 10,292 | 1,832 | 12,124 | 856 | 111 | 13,091 |
| 1974 | 9,810 | 1,737 | 11,547 | 758 | 106 | 12,411 |
| 1975 | 9,641 | 1,731 | 11,372 | 1,077 | 107 | 12,556 |
| 1976 | 10,693 | 2,073 | 12,765 | 1,099 | 119 | 13,983 |

Source: U. S. Department of Transportation, Federal Highway Administration, Bureau of Public Roads, *Highway Statistics*.

Note: Motor fuel is defined as all gasoline covered by state motor fuel tax laws plus diesel fuel and LPG used in the propulsion of motor vehicles. Military use of motor fuel and all aviation fuel use are excluded in the Department of Transportation data. Figures for highway use of fuels may be understated because of refunds given on fuel for nonhighway use such as agriculture.

## TABLE 5.7
## PRODUCTION AND CONSUMPTION OF GASOLINE IN MONTANA
## (1000 barrels)

| | Gasoline Manufactured | Gasoline Imported | Gasoline Exported | Gasoline Sold |
|---|---|---|---|---|
| 1950 | 6,981 | 513 | 2,057 | 5,438 |
| 1951 | 7,899 | 570 | 2,930 | 5,540 |
| 1952 | 8,235 | 611 | 2,902 | 5,944 |
| 1953 | 8,742 | 592 | 3,206 | 6,127 |
| 1954 | 8,452 | 632 | 2,716 | 6,369 |
| 1955 | 8,991 | 547 | 2,974 | 6,592 |
| 1956 | 10,106 | 543 | 3,711 | 6,929 |
| 1957 | 10,604 | 561 | 4,264 | 6,906 |
| 1958 | 11,438 | 548 | 5,081 | 6,966 |
| 1959 | 12,590 | 491 | 5,781 | 7,301 |
| 1960 | 12,129 | 475 | 5,090 | 7,513 |
| 1961 | 11,284 | 337 | 3,789 | 7,831 |
| 1962 | 12,596 | 406 | 4,294 | 8,707 |
| 1963 | 12,320 | 450 | 4,028 | 8,741 |
| 1964 | 12,591 | 289 | 4,214 | 8,666 |
| 1965 | 13,751 | 282 | 4,731 | 9,303 |
| 1966 | 13,910 | 185 | 4,952 | 9,143 |
| 1967 | 14,565 | 326 | 5,115 | 9,776 |
| 1968 | 14,320 | 223 | 5,183 | 9,360 |
| 1969 | 14,629 | 275 | 5,104 | 9,800 |
| 1970 | 13,007 | 194 | 3,952 | 9,249 |
| 1971 | 13,613 | 214 | 4,090 | 9,737 |
| 1972 | 14,390 | 219 | 4,251 | 10,358 |
| 1973 | 15,191 | 634 | 4,792 | 11,033 |
| 1974 | 14,923 | 229 | 4,495 | 10,657 |
| 1975 | 15,498 | 176 | 4,759 | 10,914 |
| 1976 | 16,281 | 212 | 4,771 | 11,722 |
| 1977 | 13,654 | 345 | 1,959 | 12,040 |
| 1978 | 14,171 | 418 | 2,094 | 12,495 |

Source: Montana Department of Revenue, Motor Fuel Tax Division.

## TABLE 5.8
## SALES OF PETROLEUM PRODUCTS IN MONTANA
## (1000 barrels)

| | Distillate Fuel Oil | Residual Fuel Oil | Kerosene | LPG |
|---|---|---|---|---|
| 1950 | 2,478 | 4,222 | 231 | 211 |
| 1951 | 2,851 | 4,958 | 267 | 275 |
| 1952 | 3,063 | 4,220 | 277 | 324 |
| 1953 | 3,553 | 3,276 | 252 | 402 |
| 1954 | 3,755 | 1,751 | 261 | 537 |
| 1955 | 3,980 | 1,692 | 215 | 537 |
| 1956 | 4,219 | 1,646 | 213 | 610 |
| 1957 | 4,209 | 1,554 | 201 | 661 |
| 1958 | 3,642 | 1,643 | 303 | 296 |
| 1959 | 4,474 | 2,006 | 544 | 811 |
| 1960 | 4,713 | 2,022 | 476 | 737 |
| 1961 | 4,589 | 2,533 | 359 | 856 |
| 1962 | 5,522 | 3,049 | 265 | 819 |
| 1963 | 5,400 | 2,836 | 348 | 765 |
| 1964 | 5,684 | 2,356 | 651 | 931 |
| 1965 | 5,041 | 1,195 | 248 | 926 |
| 1966 | 5,802 | 1,371 | 117 | 1,165 |
| 1967 | 3,459 | 1,189 | 860 | 1,585 |
| 1968 | 4,119 | 1,495 | 816 | 1,685 |
| 1969 | 4,669 | 1,524 | 656 | 1,690 |
| 1970 | 4,823 | 1,249 | 376 | 1,327 |
| 1971 | 5,101 | 1,236 | 362 | 1,403 |
| 1972 | 6,121 | 1,485 | 383 | 1,704 |
| 1973 | 6,924 | 1,705 | 405 | 1,502 |
| 1974 | 7,646 | 2,290 | 174 | 1,465 |
| 1975 | 7,459 | 2,186 | 126 | 1,370 |
| 1976 | 8,383 | 2,549 | 80 | 1,420 |
| 1977 | 8,194 | 2,414 | 94 | 1,370 |

Source: United States Department of Energy, Energy Information Administration.
Note: Distillate fuel oil includes diesel fuel for both on- and off-highway use. Some petroleum products are stored in secondary facilities, so sales figures do not necessarily equal consumption of those products during the given time period.

## TABLE 5.9
## SALES OF RESIDUAL FUEL OIL IN MONTANA BY SECTOR
## (1000 barrels)

| Year | Heating | Industrial | Electric Utility | Oil Company | Military | Railroads | Other | Total |
|---|---|---|---|---|---|---|---|---|
| 1960 | 354 | 439 | 2 | 817 | 70 | 299 | 41 | 2,022 |
| 1961 | 465 | 649 | 0 | 756 | 151 | 455 | 57 | 2,533 |
| 1962 | 1,011 | 568 | 0 | 931 | 86 | 385 | 68 | 3,049 |
| 1963 | 879 | 652 | 3 | 807 | 11 | 396 | 88 | 2,836 |
| 1964 | 503 | 664 | 53 | 712 | 9 | 299 | 116 | 2,356 |
| 1965 | 504 | 65 | 0 | 257 | 0 | 313 | 56 | 1,195 |
| 1966 | 482 | 56 | 45 | 342 | 118 | 263 | 65 | 1,371 |
| 1967 | 419 | 48 | 6 | 296 | 102 | 228 | 90 | 1,189 |
| 1968 | 419 | 102 | 23 | 681 | 56 | 185 | 29 | 1,495 |
| 1969 | 226 | 232 | 105 | 683 | 54 | 179 | 45 | 1,524 |
| 1970 | 183 | 109 | 9 | 792 | 45 | 74 | 37 | 1,249 |
| 1971 | 177 | 225 | 0 | 732 | 45 | 40 | 17 | 1,236 |
| 1972 | 209 | 227 | 16 | 967 | 32 | 32 | 2 | 1,485 |
| 1973 | 208 | 243 | 71 | 1,112 | 16 | 28 | 27 | 1,705 |
| 1974 | 376 | 465 | 3 | 1,307 | 80 | 44 | 15 | 2,290 |
| 1975 | 429 | 543 | 0 | 1,022 | 127 | 38 | 27 | 2,186 |
| 1976 | 858 | 562 | 0 | 962 | 147 | 0 | 20 | 2,549 |
| 1977 | 672 | 666 | 76 | 787 | 137 | 0 | 76 | 2,414 |

Source: United States Department of Energy, Energy Information Administration, Energy Data Reports, *Sales of Fuel Oil and Kerosine, Annual.*

Note: Distillate fuel oil includes diesel fuel for both on- and off-highway use. Some petroleum products are stored in secondary facilities, so sales figures do not necessarily equal consumption of those products during the given time period.

## TABLE 5.10
## SALES OF DISTILLATE FUEL OIL IN MONTANA BY SECTOR
## (1000 barrels)

| | Heating | Industrial | Electric Utility | Oil Company | Military | Railroads | Other | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Diesel[1] | Total | |
| 1960 | 902 | 141 | 0 | 7 | 57 | 2,241 | 1,312 | 1,365 | 4,713 |
| 1961 | 1,132 | 125 | 0 | 9 | 29 | 1,880 | 1,288 | 1,414 | 4,589 |
| 1962 | 1,324 | 220 | 0 | 12 | 26 | 1,720 | 1,946 | 2,220 | 5,522 |
| 1963 | 1,307 | 213 | 0 | 47 | 41 | 1,701 | 1,868 | 2,088 | 5,400 |
| 1964 | 1,080 | 361 | 0 | 39 | 38 | 1,833 | 2,050 | 2,330 | 5,684 |
| 1965 | 1,096 | 210 | 0 | 15 | 17 | 1,632 | 2,026 | 2,067 | 5,041 |
| 1966 | 1,092 | 257 | 0 | 22 | 0 | 1,464 | 2,662 | 2,967 | 5,802 |
| 1967 | 829 | 99 | 0 | 2 | 11 | 1,362 | NA | 1,156 | 3,459 |
| 1968 | 1,045 | 114 | 0 | 10 | 16 | 1,270 | 1,423 | 1,664 | 4,119 |
| 1969 | 1,197 | 148 | 14 | 60 | 20 | 1,469 | 1,537 | 1,761 | 4,669 |
| 1970 | 1,011 | 144 | 0 | 14 | 26 | 1,623 | 1,808 | 2,005 | 4,823 |
| 1971 | 1,095 | 136 | 0 | 18 | 22 | 1,674 | 2,026 | 2,156 | 5,101 |
| 1972 | 1,219 | 774 | 9 | 40 | 43 | 1,808 | 1,988 | 2,228 | 6,121 |
| 1973 | 1,337 | 890 | 159 | 31 | 29 | 1,918 | NA | 2,560 | 6,924 |
| 1974 | 1,346 | 1,090 | 49 | 35 | 28 | 2,302 | 2,430 | 2,796 | 7,646 |
| 1975 | 1,425 | 1,236 | 59 | 38 | 35 | 1,999 | 2,305 | 2,667 | 7,459 |
| 1976 | 1,789 | 1,156 | 117 | 41 | 12 | 1,955 | 2,876 | 3,313 | 8,383 |
| 1977 | 1,892 | 1,015 | 79 | 37 | 10 | 1,825 | 2,938 | 3,336 | 8,194 |

Source: United States Department of Energy, Energy Information Administration Energy Data Reports, *Sales of Fuel Oil and Kerosine, Annual.*

Note: Distillate fuel oil includes diesel fuel for both on- and off-highway use. Some petroleum products are stored in secondary facilities, so sales figures do not necessarily equal consumption of those products during the given time period.

[1]Includes both on- and off-highway use.

## TABLE 5.11
## SALES OF LPG IN MONTANA BY SECTOR
## (1000 barrels)

| | Residential and Commercial | Internal Combustion Engine Use | Industrial Use | Other Use | Total |
|---|---|---|---|---|---|
| 1960 | 596 | 125 | 16 | 0 | 737 |
| 1961 | 724 | 118 | 11 | 3 | 856 |
| 1962 | 659 | 132 | 27 | 1 | 819 |
| 1963 | 587 | 126 | 51 | 1 | 765 |
| 1964 | 771 | 102 | 58 | 0 | 931 |
| 1965 | 748 | 46 | 132 | 0 | 926 |
| 1966 | 891 | 65 | 209 | 0 | 1,165 |
| 1967 | 1,170 | 162 | 253 | 0 | 1,585 |
| 1968 | 1,257 | 188 | 240 | 0 | 1,685 |
| 1969 | 1,261 | 199 | 229 | 1 | 1,690 |
| 1970 | 1,044 | 99 | 179 | 5 | 1,327 |
| 1971 | 1,065 | 132 | 202 | 4 | 1,403 |
| 1972 | 1,287 | 199 | 211 | 7 | 1,704 |
| 1973 | 1,136 | 169 | 191 | 5 | 1,502 |
| 1974 | 1,207 | 139 | 119 | 0 | 1,465 |
| 1975 | 1,145 | 123 | 101 | 0 | 1,370 |
| 1976 | 1,168 | 114 | 138 | 0 | 1,420 |
| 1977 | 1,169 | 77 | 124 | 0 | 1,370 |

Source: United States Department of Energy, Energy Information Administration, Energy Data Reports, *Sales of LPG, Annual.*
Note: Distillate fuel oil includes diesel fuel for both on- and off-highway use. Some petroleum products are stored in secondary facilities, so sales figures do not necessarily equal consumption of those products during the given time period.

## TABLE 5.12
## DISTRIBUTION OF MONTANA CRUDE OIL EXPORTS BY STATE OF DESTINATION
## (1000 barrels)

| State of Destination | 1973 | 1974 | 1975 | 1976 | 1977 |
|---|---|---|---|---|---|
| Pennsylvania | 346 | 360 | 769 | 368 | 314 |
| Illinois | 3,096 | 2,608 | 2,236 | 7,713 | 6,613 |
| Indiana | 13,720 | 14,435 | 10,907 | 7,422 | 5,741 |
| Kansas | 1,638 | 1,065 | 1,020 | 935 | 227 |
| Michigan | 0 | 0 | 0 | 0 | 224 |
| Minnesota, Wisconsin | 1,199 | 1,617 | 2,026 | 2,029 | 2,350 |
| Missouri, Nebraska | 0 | 80 | 654 | 1,268 | 1,080 |
| North Dakota | 1,065 | 1,374 | 1,304 | 1,285 | 1,229 |
| Ohio | 80 | 115 | 59 | 225 | 141 |
| Oklahoma | 0 | 50 | 0 | 0 | 0 |
| Colorado | 793 | 573 | 256 | 83 | 222 |
| Wyoming | 654 | 361 | 498 | 26 | 748 |
| Utah | 0 | 0 | 784 | 0 | 0 |
| Other States | 0 | 0 | 0 | 1 | 8 |
| **TOTAL** | **22,591** | **22,638** | **20,513** | **21,355** | **18,897** |

Source: United States Department of Energy, Energy Information Administration, "Crude Petroleum, Petroleum Products and Natural Gas Liquids, Final Summary."

6

# URANIUM

## TABLES


| Table | | Page |
|---|---|---|
| 6.1 | Estimated Uranium Ore Reserves by States, January 1, 1975 | 66 |
| 6.2 | Existing Uranium Leases on State Land in Montana as of January 2, 1979 | 67 |
| 6.3 | Active Uranium Prospecting Permits in Montana as of January 15, 1979 | 68 |

## TABLE 6.1
## ESTIMATED URANIUM ORE RESERVES BY STATES, JANUARY 1, 1975

| State | Tons of Ore (Millions) | Grade of Ore (% $U_3O_8$) | Tons of $U_3O_8$ |
|---|---|---|---|
| New Mexico | 74.8 | 0.22 | 168,000 |
| Wyoming | 62.2 | 0.16 | 102,000 |
| Colorado | 2.9 | 0.28 | 8,000 |
| Utah | 2.8 | 0.21 | 6,000 |
| Others: | | | |
| Arizona | | | |
| North Dakota | | | |
| South Dakota | | | |
| Texas | | | |
| Washington | | | |
| Oregon | | | |
| Montana | | | |
| California | | | |
| Alaska | 24.9 | 0.12 | 31,000 |
| **TOTAL** | **167.6** | | **315,000** |

Source: United States Energy Research and Development Administration, press release, "ERDA Estimates United States Uranium Reserves," March 21, 1975.

## TABLE 6.2
## EXISTING URANIUM LEASES ON STATE LAND IN MONTANA AS OF JANUARY 2, 1979

| County | Acres | Company |
|---|---|---|
| Beaverhead | 440 | E. O. Larson |
| Broadwater | 982 | The Anaconda Company |
| Carter | 1,920 | Montana Nuclear Corp. |
| | 1,920 | McMahon — Bullington |
| | 6,907 | Kerr McGee Corp. |
| | 640 | Frontier Res., Inc. |
| | 800 | Mobile Oil Corp. |
| | 960 | Homestake Mining Co. |
| Choteau | 120 | Wyoming Mineral Corp. |
| Gallatin | 2,080 | Lucky McUranium Corp. |
| Jefferson | 400 | Continental Oil Company |
| | 2,240 | The Anaconda Company |
| Lewis and Clark | 1,120 | St. Joe American Corp. |
| Madison | 1,119 | Lucky McUranium Corp. |
| | 480 | The Anaconda Company |
| Meagher | 2,560 | Lucky McUranium Corp. |
| Powder River | 1,280 | Wm. Bateman |
| Stillwater | 11,840 | Sabine Production Co. |
| Sweet Grass | 320 | Sabine Production Co. |
| Yellowstone | 3,672 | D. H. Willson |
| **TOTAL** | **41,800** | |

Source: Montana Department of State Land, Mineral Lease Bureau, Ethel Schenk, personal communication, January 1977.
Note: Data not available on federal and private lands.

## TABLE 6.3
## ACTIVE URANIUM PROSPECTING PERMITS IN MONTANA AS OF JANUARY 15,1979

| Permittee | Acres | County |
|---|---|---|
| Anaconda Company | 1.8 | Broadwater and Jefferson |
| Anschutz Uranium Corporation | 24.0 | Carbon |
| Montana Bureau of Mines and Geology | 1.2 | Missoula and Ravalli |
| Continental Oil Company | 16.6 | Jefferson and Mineral |
| Everest Exploration Company | 1.0 | Jefferson |
| Exxon Company, U.S.A. | 12.2 | Powder River, Carbon, and Carter |
| George E. Guay | 1.0 | Carbon |
| Frontier Resources, Incorporated | 4.4 | Carter |
| Kerr-McGee Corporation | 105.6 | Carter |
| Sabine Production Company | 15.0 | Stillwater |
| St. Joe American Corporation | 7.4 | Lewis and Clark and Madison |
| Uranium Resources, Incorporated | 10.0 | Carter |
| **TOTAL** | **202.2** | |

Source: Montana Department of State Lands, Reclamation Division, Coal and Uranium Bureau, Susan McAnally, personal communication, January, 1979.

# APPENDIX

# NOTES TO TABLES

Because of their length, the following notes to tables have been placed in the Appendix. Each set of notes is preceded by its chapter heading.

## NATURAL GAS

All volumetric data presented in chapter 4 are expressed using a pressure base of 14.73 pounds per square inch absolute (psia) at 60 degrees Fahrenheit (60°F). Conversions to this uniform pressure base were made by the Energy Division, where necessary.

4.1 Proved reserves are the estimated amounts of natural gas and oil that geologic and engineering data indicate are recoverable from known reservoirs under present economic and operating conditions. Natural gas is classified in two categories based on type of occurrence in reservoirs, as follows:

1. Nonassociated gas is defined as free natural gas not in contact with crude oil in the reservoir.
2. Associated/dissolved gas is the combined volume of natural gas which occurs in crude oil reservoirs either as free gas (associated) or as gas in solution with the crude oil (dissolved).

Since 1973, only the recoverable portion of natural gas in underground storage has been reported.

4.2 Montana Oil and Gas Conservation Division production data is based on reports by gas producers. It excludes gas vented or flared and gas used in repressuring. It equals by definition the U.S. Bureau of Mines marketed production, except that some volumes of gas withdrawn from storage facilities in Montana may be included in the Oil and Gas Conservation Division data. Source documents for the production data use a pressure base of 15.025 psia at 60°F., which was converted to 14.73 psia at 60°F.

Montana Department of Revenue data is based on tax receipts received from industry. Average wellhead price is computed as the total value divided by the total volume of gas. Source documents report data for natural gas at 15.025 psia at 60°F., which was converted to 14.73 psia at 60°F.

4.3 AGA data covers sales of natural gas by utilities only; it does not include sales directly from producer to end-user. In the United States, direct sales make up a significant portion of total gas use, particularly in the industrial sector. In Montana, direct sales are not significant; hence, AGA "total sales" is close to the Bureau of Mines "total gas delivered." Some electricity utility use of gas is included in the industrial sector.

Average heat content is highly variable, depending on elevation. Any natural gas data that has been converted to Btu's (table 4.3, for instance) is therefore only a rough approximation.

4.4 Source documents used for this table report data at sales pressure base, rather than a uniform pressure. Conversion to 14.73 psia was accomplished as follows:

1. Data for Montana-Dakota Utilites was adjusted to a uniform pressure base by Montana-Dakota Utilities;
2. Data for the Montana Power Company assumes a pressure base in the source document of 14.9 psia and uses this base for its calculations. This appears to be very close for the industrial sector, but may overstate residential/commercial sales by a few percent;
3. Data for Great Falls Gas Company assumes a pressure base in the source document of 13.28 psia.

The "other" category for sales by Montana Power Company consists of sales of natural gas to government and municipal authorities for heating. Sales of natural gas to Canada are not included in "total sales." "Other" sales by Montana-Dakota Utilities (MDU) consist of natural gas used in MDU electric generating plants at Baker, Glendive, Sidney, and Miles City. "Other" sales by Great Falls Gas Company are sales of natural gas to Malmstrom Air Force Base.

"Other Utilities" include the following companies (listed in approximate descending order by volume of sales):

Cut Bank Gas Company (supplies gas to Cut Bank, Montana; about 80 percent of gas purchased from Montana Power Company).

Shelby Gas Association (supplies gas to Shelby, Montana; gas is purchased from Montana Power Company).

Consumers Gas Company (supplies gas to Ferdig, Oilmont, Sunburst, and Sweetgrass, Montana; gas is purchased from Montana Power Company and Hardrock Oil Company through the Treasure State Pipeline Company).

Saco Municipal Gas Company (supplies gas to Saco, Montana from the town's own wells).

4.6 "Gross withdrawal" is defined as marketed production, plus gas vented and flared, plus gas used for repressuring.

"Consumption" is defined as total gas delivered to consumers, plus extraction loss, plus lease and plant fuel, plus pipeline fuel. Total gas delivered is the sum of gas delivered to residential, commercial, industrial, electric utility, and other consumers. Industrial use includes refinery use of gas but excludes pipeline fuel. The amount of electric utility use of gas was obtained from the Federal Power Commission. Other use consists primarily of deliveries to municipalities and public authorities for institutional heating, street lighting, and so on. This sector was not reported until 1967; prior to that year, it was primarily contained within the industrial sector.

## CRUDE PETROLEUM AND PETROLEUM PRODUCTS

5.5 Data originally reported by the Montana Oil and Gas Conservation Division have been revised, as indicated on table 5.5, by the Montana Energy Office on the basis of further information received from individual refineries. The Oil and Gas Conservation Division data appear to have originally understated Canadian inputs and overstated Wyoming inputs to the Continental Oil refinery, at least for the years 1968-75. Canadian inputs to the Big West Oil and Westco refineries were apparently not reported to the Oil and Gas Conservation Division. Revised data are only available for the years 1972-75, but it is likely that significant Canadian inputs to these two refineries existed prior to 1972.

MONTANA
DEPARTMENT OF NATURAL
RESOURCES & CONSERVATION
Helena, Montana




Printed by
COLOR WORLD OF MONTANA, INC
201 E. Mendenhall, Bozeman MT 59715